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F. E. Clements, C. O. Rosendahl
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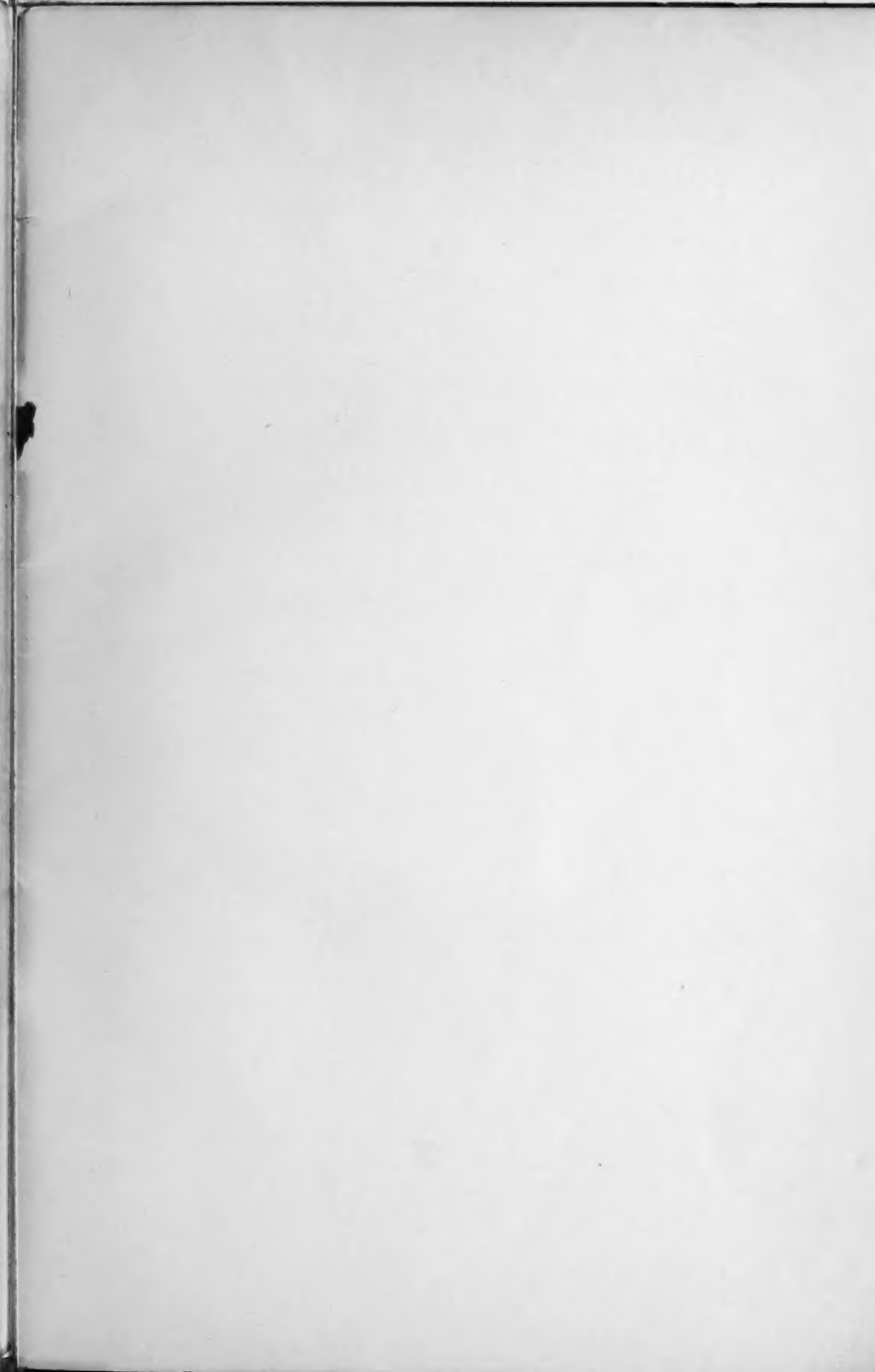
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GEOLOGICAL AND NATURAL HISTORY SURVEY OF MINNESOTA
MINNESOTA BOTANICAL SURVEY
FREDERIC E. CLEMENTS, *State Botanist*

Minnesota Plant Studies

I
GUIDE
TO THE
SPRING FLOWERS OF MINNESOTA
FIELD AND GARDEN
THIRD EDITION

University of Minnesota
Minneapolis
1913



Minnesota Plant Studies

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GUIDE
TO THE
SPRING FLOWERS OF MINNESOTA
FIELD AND GARDEN
THIRD EDITION

F. E. CLEMENTS, C. O. ROSENDAHL
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F. K. BUTTERS

University of Minnesota
Minneapolis
May 1913

SEP 23 1940

Preface

The need for a third edition of the "Guide to Spring Flowers" has made it possible to broaden the scope of the guide. The period covered has been extended to the middle of June in the hope of including all the species that might be found by classes during an unusually early spring. In addition, the cultivated trees and the common garden species that bloom during this period have been included. In order to give the beginner greater certainty and readiness in naming plants, about 160 of the more common genera have been illustrated. Moreover, these have been grouped in plates under the various orders and families with the object of giving greater clearness to the idea of flower types outlined in the introduction, and shown in the chart of evolution and relationship.

The flowering plants of the whole school year, from September 1 to June 15, both cultivated and native, are now covered by the two guides to spring flowers and to autumn flowers. In a few years it is expected that a summer guide will be prepared, in anticipation of the time when a completely illustrated book of all the flowers of the state will be possible.

Britton and Brown's "Illustrated Flora" and Gray's "Manual" have been freely drawn upon in the preparation of the present guide, and acknowledgment is hereby made of their aid. The grouping of the families is essentially that of the Besseyan system of classification. The sequence is from pines and buttercups to pinks and mints to roses and asters, and then to lilies, grasses and orchids.

In addition to the list of publications in the following series, "Minnesota Trees and Shrubs" is also available for students and plant lovers generally. In fact, it supplants the "Guide to Trees and Shrubs," which will not be republished hereafter. "Minnesota Algae" is also valuable for schools, health officers, water and fish commissioners, as well as to others who possess microscopes.

MINNESOTA PLANT STUDIES

1. Guide to Spring Flowers, third edition (15 cents).
2. Guide to Trees and Shrubs, second edition (10 cents).
3. Guide to Ferns and Fern Allies (10 cents).
4. Minnesota Mushrooms (paper, 50 cents; cloth, \$1.00).
5. Guide to Autumn Flowers (15 cents).
6. School Gardens and Greenhouses (15 cents).

Copies of the above publications are sent free to residents of Minnesota. Ten copies of Nos. 1, 5 and 6 will be furnished free to the schools and colleges of the state. Additional copies may be secured at the price indicated. This is the price also for non-residents, who are not on the exchange list of the Botanical Survey.

FREDERIC E. CLEMENTS,

Head of the Department of Botany and State Botanist.

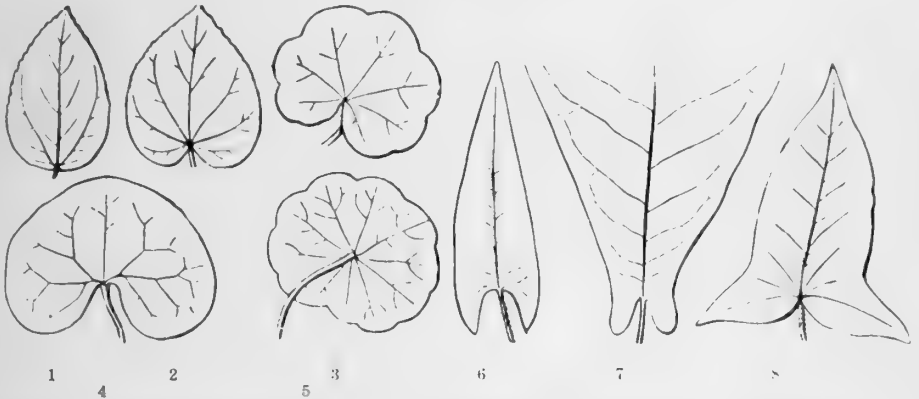
The University of Minnesota
April 1913

Introduction

HOW TO USE THE KEY

The name of a plant consists as a rule of two parts or words, for example, *Viola blanda*, *Oxalis stricta*, etc. The first word indicates the *genus*, and is always capitalized. The second word indicates the *species*, or kind, and is rarely capitalized. The meaning of the terms *genus* (plural, *genera*) and *species* (plural, *species*) may be clearly illustrated by the violets and pansy. The pansy, the prairie violet, the blue woodland violet, the yellow violet, etc., are different kinds, or *species*, of the *genus* of violets, *Viola*, each one designated by its species

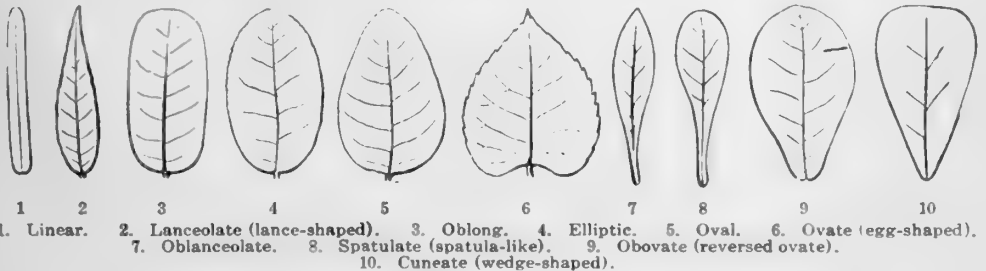
I. LEAF OUTLINES



1. Rounded. 2. Cordate (heart-shaped). 3. Reniform (kidney-shaped). 4. Peltate (shield-shaped). 5. Sagittate (arrow-shaped). 6. Auriculate (eared). 7. Hastate (halberd-shaped). 8. Hastate (halberd-shaped).

name, *tricolor*, *pedatifida*, etc. Genera which are related to each other are grouped into families, e. g., *Violaceae*, the violet family, *Liliaceae*, the lily family, etc. The ending, *-aceae*, which is always used to denote a family, is the feminine plural of the Latin suffix, *-aceus*, meaning *like* or *related to*. The family name, *Liliaceae*, is really an adjective agreeing with *plantae*, plants, and meaning "plants related to the lily." Families are themselves grouped into orders, which also bear a distinctive ending, e. g., *Liliales*, *Poales*, etc. This ending is likewise in the feminine plural, and the meaning of the name is "plant families related to the

II. LEAF OUTLINES AND BASES

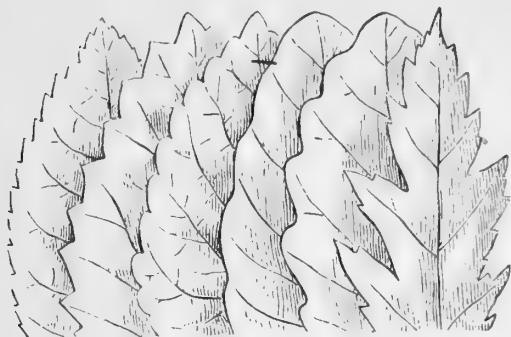


1. Linear. 2. Lanceolate (lance-shaped). 3. Oblong. 4. Elliptic. 5. Oval. 6. Ovate (egg-shaped). 7. Oblanceolate. 8. Spatulate (spatula-like). 9. Obovate (reversed ovate). 10. Cuneate (wedge-shaped).

lily family," etc. Orders are further arranged into larger groups, such as *Monocotyledons*, flowering plants with a single seed-leaf, and *Dicotyledons*, those with two seed-leaves, *Angiosperms*, flowering plants with closed pistils, and usually with sepals and petals, and *Gymnosperms*, with open pistils, and no sepals or petals.

The key to the families, as well as those to the genera and species, is as simple as the necessary drill in flower structures and relationships will permit. The keys are based on the method of alternatives, e. g., I. Petals present; II. Petals absent. The two alternatives, rarely more, are indicated by being indented equally, and by the same series of signs, e. g., 1 and 2, a and b, (x) and (y), etc. At every step the beginner must consider both alternatives before

III. LEAF EDGES



1. Serrate (saw-toothed). 2. Dentate (toothed).
3. Crenate (scalloped). 4. Undulate (wavy).
5. Sinuate (bayed). 6. Incised (jagged).

the types of the various families have developed, has the four parts: calyx, made up of sepals, corolla, made up of petals, stamens, and pistils. The normal or usual flower has sepals, petals, stamens and pistils. Flowers often occur in which one or more of these parts is lacking. Petals are most frequently absent, while sepals are often lacking also. Sepals are sometimes colored like the petals, as in lilies, and seem to be lacking when they are not. When only one kind of flower leaves is present, it is regarded as the calyx, regardless of its color. Stamens may disappear in one flower, and pistils in another, giving rise to staminate and pistillate flowers, as in many of the trees. Both rarely disappear from the same flower in nature, though this frequently happens in cultivation, especially in "double" flowers.

making a choice, in order to make sure of tracing a plant readily and certainly. Terms should be looked up in the glossary as they appear, and their meaning fixed in mind. The temptation to guess at the points of structure necessary for following the key must be constantly avoided in order to obtain trustworthy results. When unusual flower types appear in a family, the family may occur more than once in the key, or the genus concerned may be given, as "Prunus in Rosaceae."

FLOWER TYPES

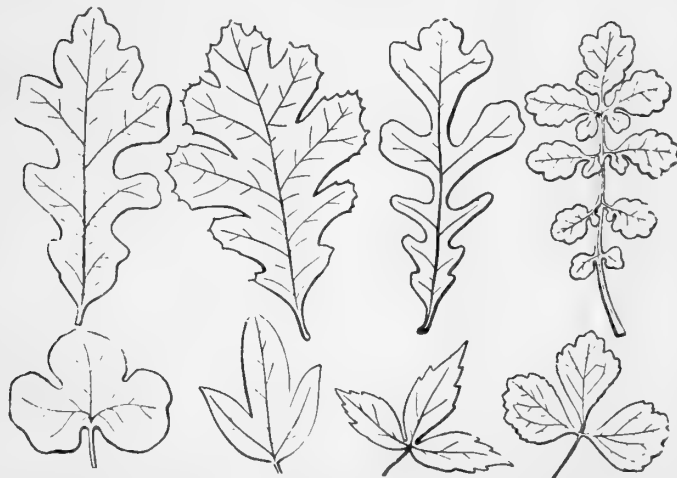
The flower type, which is regarded as the simplest or earliest form from which

IV. LEAF TIPS



1. Acuminate. 2. Acute. 3. Obtuse. 4. Truncate. 5. Retuse.
6. Emarginate. 7. Obcordate. 8. Cuspidate. 9. Mucronate.

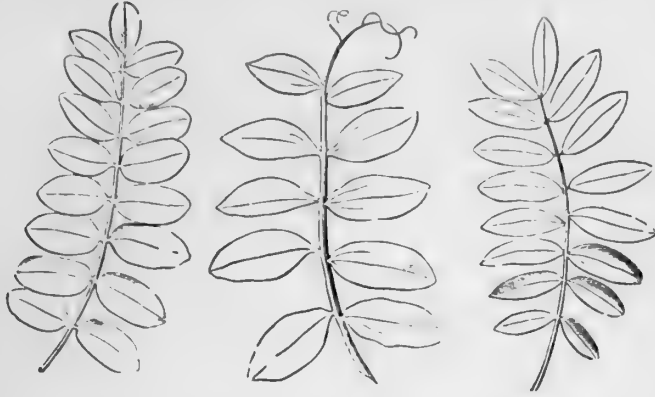
V. LOBED LEAVES



- Pinnately: 1. Lobed. 3. Cleft. 5. Parted. 7. Divided.
Palmately: 2. Lobed. 4. Cleft. 6. Parted. 8. Divided.

The simplest flower type, seen in the flower of the buttercup, or the mousetail, is made up of separate sepals, petals, stamens, and pistils. All the sepals are alike, as are the petals, and the number of stamens and pistils is large. The four parts are practically at the same level, the sepals outermost and the pistils innermost. The changes from this simplest type

have given rise to the various family types. These changes have come about by: (1) the union of parts, especially petals and pistils; (2) by the reduction in number of stamens and pistils, or the disappearance of one or more parts; (3) by changes in the form and arrangement of parts, especially the petals; (4) by a change in level, in which the sepals become united with the ovary, and the petals and stamens are placed above it. Some of these

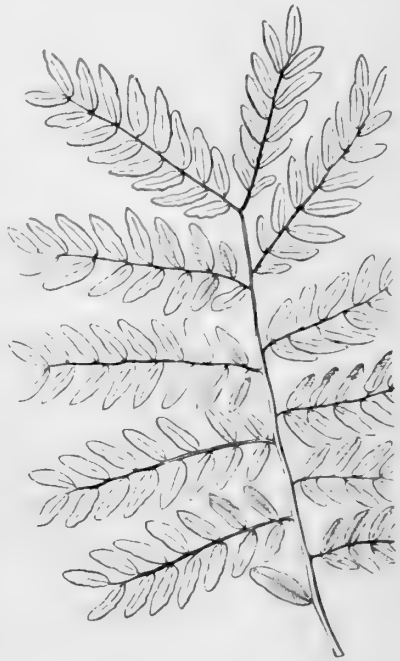


1. Odd-pinnate. 2. Tendril-pinnate. 3. Even-pinnate.

changes appear in one family, others in another. Few families show them all, and the emphasis usually falls upon one of the four possible changes. The number of possible combinations is very large. This makes it clear why it is possible to get so many flower types by modifying only four flower parts, sepals, petals, stamens and pistils, in four different ways. The three lines of evolution shown in the chart (page x) arise from the simple buttercups, and, passing through various family types, end in the three highest groups, orchids, mints and asters. In the orchids, the petals are still mostly separate; in the mints, the ovary is superior. In the asters, these changes have been completed, and this group is consequently the highest of the plant kingdom.



4. Palmate or digitate.



5. Twice-pinnate.

VI. COMPOUND LEAVES

Certain families have a very distinct type of flower structure, while practically all have some mark by which they may be told readily after some practice. The beginner should start with those families which are most readily distinguished. Such are the pea, the lily, the mustard, the aster and the grass families. From these one may advance readily to irids, orchids, snapdragons, mints, buttercups, etc. The most convenient way of expressing a

flower type and fixing it in the mind is by means of a formula. For example, the formula for the mustard family is $Ca^4 Co^4 S^{4-2} P^{(2)}$. For the pea family, it is $Ca^5 Co^{2-2-1} S^{3-1} P^1$; that is, the calyx has 5 sepals, the corolla 5 petals, wings, keel and standard; there are 10 stamens in 2 groups and a 1-celled pistil. The parenthesis indicates union of the parts concerned, while reversed numbers are used to denote irregularity in shape or arrangement, e. g., 2-2-1 for the irregular corolla of the pea. Differences in level are shown as in the following

formula for the evening primrose family:
$$\frac{Co^4 S^8}{\frac{Ca^4}{P^{(4)}}}$$

PRONUNCIATION

The names of plants, families, etc., are pronounced as in Latin, except that the consonants *c*, *g*, *j* and *v* are pronounced as in English. The sound of the vowels may be indicated as follows: *a* as ah; *e* as ay; *i* as ee; *o* as oh; *u* as oo; Greek *y* much like the German *ü*. The diphthongs are as follows: *ae* as aye; *au* as ow in how; *oe* as oy; *ei* as ay; *eu* as eoo; *ui* as ooee. The accent has been indicated for each name. Quantity has not been indicated, since for the beginner all vowels may well be regarded as long.

VERIFICATION AND DETERMINATION OF SPECIMENS

The beginner will necessarily find occasional plants which he is unable to name. Even the student of more experience will now and then find very puzzling forms. In such cases, it is necessary to refer the question to a good herbarium if one is accessible, or to the botanist. The department of botany will be glad to have fresh or dried plants sent to it for verification or determination at any time. This applies to mushrooms and other lower forms as well as to flowering plants. Fresh specimens can be sent readily through the mails by wrapping them in moist paper and placing them in a pasteboard box. The department will also be glad to verify the dried specimens in the herbaria of high schools or of individual students.

EXPLANATION OF THE CHART

The chart on page x is designed to show the general lines of descent of flowering plants from the ancestral ferns, and to indicate the relationships of the various orders. It is based primarily upon the development of the flower as a special organ for pollination and seed-production. Families with the simplest flowers, that is, those with the flowers least changed from the fruiting organs of the ferns, are placed at the bottom of the chart. Such families are found in the gymnosperms and in the buttercup order. The flowers of the former are wind-pollinated, and lack both calyx and corolla. The flowers of most buttercups, on the other hand, are pollinated by insects, and possess both calyx and corolla, or a showy calyx. These are regarded as the primitive or earliest type of flower of the angiosperms. From the specialization of these, in response to insect and wind pollination, have been derived the orders and families of the three lines of evolution shown in the chart.

In detail, the primitive flower shows a large number of separate stamens and separate pistils, the petals are alike and separate, and there is no union between any of the four parts, sepals, petals, stamens and pistils. In the increasing adaptation of a flower to its work of pollination and seed-production, this primitive form has given rise to the higher or more specialized forms characteristic of the various orders of the chart. The chief steps by which this has been brought about are four, namely, reduction in number of parts, union, change in shape, change in position of the corolla, or elevation, but these changes have not appeared in the same sequence in all three lines. Reduction in number to a flower plan of 3, 4 or 5 has been almost universal in the groups just above the buttercups, though flowers occasionally occur with number plans of 6, 7, 8 and even 9. In flower structure, the arrowheads are essentially buttercups with parts in threes, while the lilies are arrowheads with the stamens and pistils reduced in number, and the latter united to form a compound pistil. In the irises, the colored perianth of sepals and petals is upon or above the ovary, and in the orchids, the corolla is strikingly irregular, one petal usually taking the form of a lip or sack.

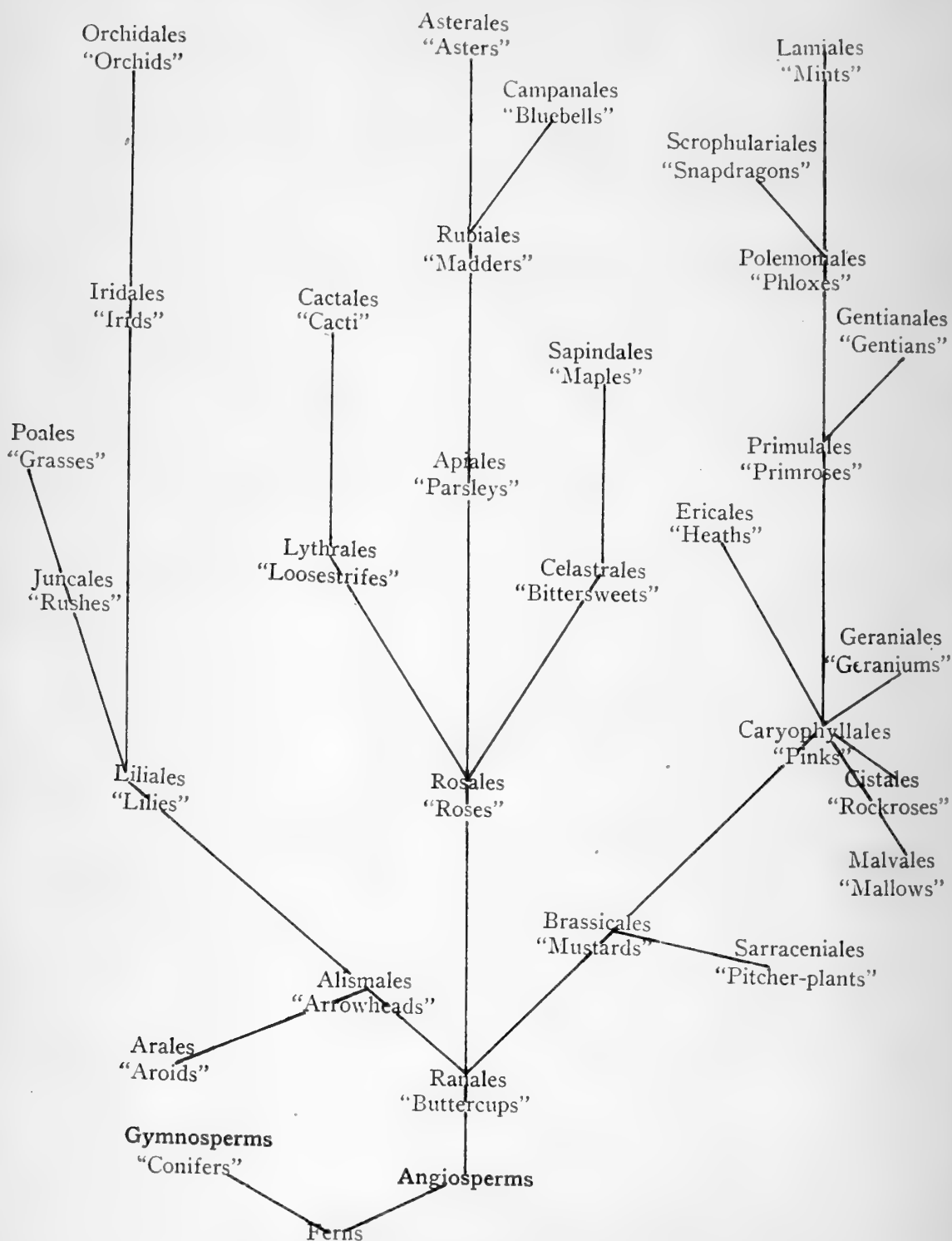
In the roses, the buttercup type is modified by the gradual growing together of the calyx and receptacle, and finally of the ovary also, with the result that the corolla and stamens

are above the calyx and ovary. In the lower roses, the number of stamens and usually of pistils also is large, and the pistils are separate. In the higher families, the pistils are united into a compound pistil. In the madders and honeysuckles, the petals have become united, and finally, in most of the asters, some or all of the flowers of the characteristic heads become irregular as to their petals. In the mustards, pinks, and geraniums, the flower parts are regularly reduced to the number plan of 4 or 5, and the pistils are united. In the primroses, the petals become united, and in the snapdragons and mints, the corolla as a rule is highly irregular.

EVOLUTION AND RELATIONSHIP OF THE ORDERS

Monocotyledons

Dicotyledons



Key to Families

| | Page |
|--|------------------------------|
| I. Petals present | |
| 1. Flowers single or in clusters | |
| a. Petals separate | |
| (1) Petals 3, rarely 2 | |
| (a) Sepals green, unlike the petals | |
| x. Leaves grass-like, flower withering the first day | <i>Commelinaceae</i> 40 |
| y. Leaves broad, flower persistent | <i>Liliaceae</i> 40 |
| (b) Sepals and petals more or less alike in color | |
| x. Flowers irregular, petals unlike | |
| (x) Stamens 1 or 2, fused with the style | <i>Orchidaceae</i> 50 |
| (y) Stamens 6-8, borne on the corolla | <i>Polygalaceae</i> 13 |
| y. Flowers regular | |
| (x) Ovary inferior | |
| m. Stamens 6 | <i>Amaryllidaceae</i> 47 |
| n. Stamens 3 | <i>Iridaceae</i> 48 |
| (y) Ovary superior | |
| m. Stamens and pistils in different flowers | <i>Smilacaceae</i> 44 |
| n. Stamens and pistils in the same flower | |
| (m) Sepals and petals greenish brown, very small | <i>Juncaceae</i> 44 |
| (n) Sepals and petals never greenish brown | <i>Liliaceae</i> 40 |
| (2) Petals 4 | |
| (a) Flowers regular | |
| x. Stamens 4-5, usually shrubs | |
| (x) Thorns present, leaves compound | <i>Rutaceae</i> 17 |
| (y) Thorns absent, leaves simple | |
| m. Leaves evergreen, very small | <i>Ericaceae</i> 18 |
| n. Leaves not evergreen | <i>Cornaceae</i> 35 |
| y. Stamens 6 | <i>Brassicaceae</i> 11 |
| z. Stamens more than 6 | |
| (x) Stamens 9-12, leaves compound | <i>Capparidaceae</i> 11 |
| (y) Stamens many, leaves simple | <i>Papaveraceae</i> 10 |
| (b) Flowers irregular | |
| x. Flowers spurred, leaves deeply cut or compound | |
| (x) Stamens many, pistils 2-3 | <i>Ranunculaceae</i> 7 |
| (y) Stamens 6, pistil 1 | <i>Fumariaceae</i> 10 |
| y. Flowers not spurred, leaves simple | <i>Onagraceae</i> 30 |
| (3) Petals 5 or more | |
| (a) Flowers regular | |
| x. Pistil simple, 1-many | |
| (x) Pistils few-many | |
| m. Twining vines, flowers dioecious | <i>Menispermaceae</i> 10 |
| n. Herbs or shrubs, flowers perfect | |
| (m) Stamens and petals coming off with the calyx | <i>Rosaceae</i> 24 |
| (n) Stamens and petals entirely free from the calyx | <i>Ranunculaceae</i> 7 |
| (y) Pistil 1 | |
| m. Stamens 6-12 | <i>Berberidaceae</i> 9 |
| n. Stamens many | |
| (m) Woody plants | <i>Prunus in Rosaceae</i> 25 |

KEY TO FAMILIES

| | | |
|--|------------------------|----|
| (n) Herbs | <i>Ranunculaceae</i> | 7 |
| y. Pistil compound | | |
| (x) Shrubs or trees | | |
| m. Vines with tendrils | <i>Vitaceae</i> | 31 |
| n. Woody plants without tendrils | | |
| (m) Leaves simple | | |
| r. Style 1 | <i>Ericaceae</i> | 18 |
| s. Styles 2 | | |
| (r) Ovary superior, usually trees | <i>Aceraceae</i> | 32 |
| (s) Ovary inferior, bushes | <i>Saxifragaceae</i> | 29 |
| t. Styles 3-5 | | |
| (r) Flowers greenish | <i>Rhamnaceae</i> | 30 |
| (s) Flowers white or pink | <i>Rosaceae</i> | 24 |
| (n) Leaves compound | | |
| r. Leaflets always 3 | | |
| (r) Flowers white | <i>Staphyleaceae</i> | 31 |
| (s) Flowers greenish | <i>Anacardiaceae</i> | 32 |
| s. Leaflets usually more than 3 | | |
| (r) Thorny shrubs | <i>Rutaceae</i> | 17 |
| (s) Thornless trees | <i>Rosaceae</i> | 24 |
| (y) Herbs | | |
| m. Leaves pitcher-shaped | <i>Sarraceniacae</i> | 13 |
| n. Leaves not pitcher-shaped | | |
| (m) Ovary many-celled, aquatic plants | <i>Nymphaeaceae</i> | 10 |
| (n) Ovary 5-celled | | |
| r. Ovary superior | | |
| (r) Leaves simple, evergreen | <i>Ericaceae</i> | 18 |
| (s) Leaves deeply cut or compound | | |
| h. Leaves deeply cut | <i>Geraniaceae</i> | 16 |
| i. Leaves trifoliate | <i>Oxalidaceae</i> | 17 |
| s. Ovary inferior | <i>Araliaceae</i> | 34 |
| (o) Ovary 1-2-celled | | |
| r. Ovary 2-celled | | |
| (r) Ovary superior | | |
| h. Leaves simple | <i>Saxifragaceae</i> | 29 |
| i. Leaves trifoliate | <i>Menyanthaceae</i> | 20 |
| (s) Ovary inferior | <i>Apiaceae</i> | 35 |
| s. Ovary 1-celled | | |
| (r) Sepals 5 | | |
| h. Styles 2 | <i>Saxifragaceae</i> | 29 |
| i. Styles 3-5 | <i>Caryophyllaceae</i> | 14 |
| (s) Sepals 2 | | |
| h. Stamens many | <i>Papaveraceae</i> | 10 |
| i. Stamens 5. | <i>Portulacaceae</i> | 15 |
| (b) Flowers irregular | | |
| x. Ovary 3-celled, stamens long-exserted | <i>Sapindaceae</i> | 32 |
| y. Ovary 1-celled, stamens mostly included | | |
| (x) Flowers spurred | <i>Violaceae</i> | 13 |
| (y) Flowers not spurred | <i>Fabaceae</i> | 27 |
| b. Petals united | | |
| (a) Ovary superior | | |
| x. Low mostly evergreen shrubs | <i>Ericaceae</i> | 18 |
| y. Herbs | | |
| (x) Ovary 1-celled | | |
| m. Carpels 2 | <i>Hydrophyllaceae</i> | 21 |
| n. Carpels 5 | <i>Primulaceae</i> | 19 |

KEY TO FAMILIES

3

| | | |
|---|------------------------------|----|
| (y) Ovary 2-celled or 4-lobed | | |
| m. Ovary 2-celled | | |
| (m) Leafless colorless herbs | <i>Orobanchaceae</i> | 23 |
| (n) Leafy herbs | | |
| r. Petals very hairy on the upper face | <i>Menyanthaceae</i> | 20 |
| s. Petals smooth | | |
| (r) Stamens 5; flowers regular | <i>Solanaceae</i> | 21 |
| (s) Stamens 2-4; flowers irregular | <i>Scrophulariaceae</i> | 22 |
| n. Ovary 4-lobed or divided | | |
| (m) Flowers irregular, stem usually square | <i>Lamiaceae</i> | 24 |
| (n) Flowers regular | <i>Boraginaceae</i> | 21 |
| (z) Ovary 3-celled | <i>Polemoniaceae</i> | 20 |
| (b) Ovary inferior | | |
| x. Woody plants | | |
| (x) Stamens 5 | <i>Caprifoliaceae</i> | 36 |
| (y) Stamens 8-10 | <i>Ericaceae</i> | 18 |
| y. Herbs | | |
| (x) Stamens 3 | <i>Valerianaceae</i> | 38 |
| (y) Stamens 4-5 | | |
| m. Stamens united, sap milky | <i>Campanulaceae</i> | 38 |
| n. Stamens separate | | |
| (m) Leaves united by their bases | <i>Caprifoliaceae</i> | 36 |
| (n) Leaves not united | <i>Rubiaceae</i> | 36 |
| (z) Stamens 8-12 | <i>Adoxaceae</i> | 37 |
| 2. Flowers in heads | | |
| a. Ovary superior | <i>Trifolium in Fabaceae</i> | 28 |
| b. Ovary inferior | | |
| (1) Petals separate, style simple | <i>Cornaceae</i> | 35 |
| (2) Petals united, style 2-cleft | | |
| (a) Flowers all ligulate, sap milky | <i>Cichoriaceae</i> | 39 |
| (b) Some or all of the flowers tubular, sap not milky | <i>Asteraceae</i> | 38 |
| II. Petals absent | | |
| 1. Sepals present, rarely very minute | | |
| a. Woody plants | | |
| (1) High climbing vines, petals present but falling quickly | <i>Vitaceae</i> | 31 |
| (2) Shrubs or trees | | |
| (a) Flowers in catkins, at least the staminate | | |
| x. Pistillate flowers in catkins, sap milky | <i>Moraceae</i> | 16 |
| y. Pistillate flowers solitary, sap not milky | <i>Fagaceae</i> | 34 |
| (b) No catkins present | | |
| x. Style 1, stigma 1, or slightly 2-cleft | | |
| (x) Trees with compound leaves | <i>Oleaceae</i> | 20 |
| (y) Low shrubs with simple leaves | | |
| m. Leaves green, glabrous | <i>Thymeleaceae</i> | 31 |
| n. Leaves silvery or scurfy | <i>Elacagnaceae</i> | 31 |
| y. Styles or long sessile stigmas 2 | | |
| (x) Leaves deeply cut or compound | <i>Aceraceae</i> | 32 |
| (y) Leaves simple, not deeply cut | <i>Ulmaceae</i> | 16 |
| z. Pistils 2-5, thorny shrub | <i>Rutaceae</i> | 17 |
| b. Herbs | | |
| (1) Nearly colorless herbs, parasitic on trees | <i>Loranthaceae</i> | 31 |
| (2) Plants with green leaves | | |
| (a) Pistils several-many | <i>Ranunculaceae</i> | 7 |
| (b) Pistil 1, at least the ovary | | |
| x. Sepals united into a corolla-like tube | <i>Allioniaceae</i> | 15 |

KEY TO FAMILIES

| | | |
|---|-------------------------|----|
| y. Sepals not united in a corolla-like tube | | |
| (x) Stamens as many as the sepals | | |
| m. Flowers in dense fleshy spikes | <i>Araceae</i> | 39 |
| n. Flowers not in fleshy spikes | | |
| (m) Ovary superior, styles and stigmas 3 | <i>Polygonaceae</i> | 15 |
| (n) Ovary half-inferior, style and stigma 1 | <i>Santalaceae</i> | 31 |
| (o) Ovary wholly inferior, styles and stigmas 2 | <i>Apiaceae</i> | 35 |
| (y) Stamens more numerous than the sepals | | |
| m. Ovary inferior, sepals 3 | <i>Aristolochiaceae</i> | 30 |
| n. Ovary superior, sepals 4 or 5 | | |
| (m) Sepals 4, stamens 6-8 | | |
| r. Stamens 6, style and stigma 1 | <i>Brassicaceae</i> | 11 |
| s. Stamens usually 8, styles and stigmas 2 | <i>Saxifragaceae</i> | 29 |
| (n) Sepals 5 | | |
| r. Stamens numerous, styles 3, stigmas 6 | <i>Euphorbiaceae</i> | 18 |
| s. Stamens 6-8 | <i>Polygonaceae</i> | 15 |
| 2. Sepals absent, or occasionally very minute | | |
| a. Woody plants | | |
| (1) Leaves scale-like or needle-like, usually evergreen | | |
| (a) Leaves resinous, fragrant when bruised; fruit a cone or several seeded blue berry | <i>Pinaceae</i> | 5 |
| (b) Leaves not resinous nor fragrant; fruit a one-seeded red berry | <i>Taxaceae</i> | 6 |
| (2) Leaves not scale-like or needle-like, deciduous | | |
| (a) Leaves simple | | |
| x. Fruit with many hairy seeds, flowers dioecious | <i>Salicaceae</i> | 15 |
| y. Fruit one-seeded, flowers usually monoecious | | |
| (x) Low shrubs with very fragrant leaves | <i>Myricaceae</i> | 34 |
| (y) Trees, rarely shrubs; leaves not fragrant | <i>Betulaceae</i> | 33 |
| (b) Leaves compound | | |
| x. Leaves alternate, staminate flowers in catkins | <i>Juglandaceae</i> | 32 |
| y. Leaves opposite, flowers in clusters | <i>Oleaceae</i> | 20 |
| b. Herbs | | |
| (1) Flowers in heads surrounded by 5 petal-like glands | <i>Euphorbiaceae</i> | 18 |
| (2) Flowers in spikes or spikelets | | |
| (a) Spike fleshy, with a leafy spathe | <i>Araceae</i> | 39 |
| (b) Flowers in papery spikelets, with scales | | |
| x. Flower enclosed in two scales; stem hollow, round | <i>Poaceae</i> | 45 |
| y. Flower with a single scale; stem solid, mostly triangular | <i>Cyperaceae</i> | 45 |

Spermatophytes Flowering Plants

Gymnospermae Gymnosperms

Pinales Pine Order

Pináceae—Pine Family

Resinous trees or shrubs, usually evergreen; flowers monoecious or dioecious, cone-like; staminate of an elongated axis bearing numerous scale-like or peltate stamens; the pistillate flower, an axis bearing scales in a single or double series, the fertile scales bearing 1-many (usually 2) naked ovules; fruit usually a cone with hard, dry scales, occasionally berry-like, the scales becoming fleshy.

I. Leaves linear, needle-like, alternate or in fascicles (Tribe Abietineae)

1. Foliage leaves all scattered, alternate

a. Leaves flat, linear, more or less twisted into two ranks

(1) Buds small, round, resinous; cones upright with deciduous scales

Abies

(2) Buds scaly, not resinous; cones pendent with persistent scales

(a) Leaves about 2 cm. long, their scars scarcely raised; bracts of cone long

Pseudotsuga

(b) Leaves about 1 cm. long, their scars raised on woody projections; bracts of cone short

Tsuga

b. Leaves four-sided in section, not at all two-ranked, their scars raised on woody projections

Picea

2. Foliage leaves or some of them in fascicles

a. Leaves deciduous, some scattered, others in large fascicles

Larix

b. Leaves evergreen, in fascicles of 2-5

Pinus

II. Leaves needle-like or scale-like, opposite or in whorls (Tribe Cupressineae)

1. Cones woody; twigs and spray flat; leaves scale-like of two alternating types

Thuja

2. Cones fleshy; twigs and spray not flattened; leaves scale- or needle-like, all alike on any twig

a. Leaves usually opposite, scale-like on mature twigs

Sabina

b. Leaves in whorls of three, all needle-like

Juniperus

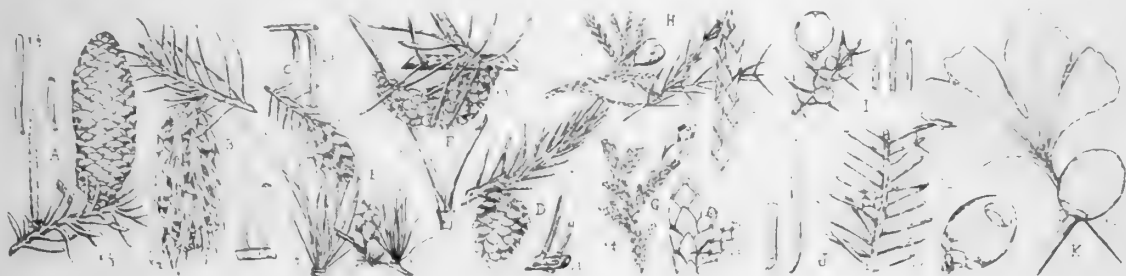


PLATE 1: A, *Abies balsamea*; B, *Pseudotsuga taxifolia*; C, *Tsuga canadensis*; D, *Picea mariana*; E, *Larix laricina*; F, *Pinus banksiana*; G, *Thuja occidentalis*; H, *Sabina virginiana*; I, *Juniperus communis*; J, *Taxus canadensis*; K, *Ginkgo biloba*.

Abies—Balsam Fir

(L. and Gr. *abies*, fir tree)

Pl. 1, fig. A

1. Native tree; leaves dark green above, fragrant, 1-2 cm. long

A. balsamea

2. Cultivated West-American tree; leaves pale above, 2-3.5 cm. long

A. concolor

PINACEAE—TAXACEAE

Pseudotsúga—Douglas Fir

(Gr. *pseudes*, false, Japanese *tsuga*, hemlock)

Pl. 1, fig. B

Cultivated West-American tree with flat soft leaves

Ps. taxifolia

Tsúga—Hemlock

(Japanese *tsuga*, hemlock)

Pl. 1, fig. C

Native and cultivated tree with small dark green flat leaves

T. canadensis

Picea—Spruce

(L. *picea*, spruce or fir tree, from *pix*, pitch)

Pl. 1, fig. D

1. Twigs spreading horizontally; cones less than 8 cm. long

a. Twigs smooth; cone-scales flexible

(1) Leaves very stiff and blue, 25-30 mm. long; cultivated

P. pungens

(2) Leaves slender, 10-25 mm. long; native

P. canadensis

b. Twigs minutely hairy; leaves 5-15 mm. long; cone-scales stiff; native

P. mariana

2. Twigs drooping; cones 10-20 cm. long; cultivated

P. abies

Lárix—Larch, Tamarack

(L. *larix*, larch tree)

Pl. 1, fig. E

1. Native tree; mature cones 1-1.5 cm. long

L. laricina

2. Cultivated tree; mature cones 2.5-3.5 cm. long

L. decidua

Pinus—Pine

(L. *pinus*, the pine tree)

Pl. 1, fig. F

1. Leaves in fascicles of 5; cones 15-20 cm. long

P. strobus

2. Leaves in fascicles of 2; cones 2-5 cm. long

a. Leaves more than 1 dm. long

(1) Leaves thin, flexible; bark reddish; native

P. resinosa

(2) Leaves thick, stiff; bark gray; cultivated

P. laricio austriaca

b. Leaves less than 1 dm. long

(1) Trees usually 4-20 m. high

(a) Leaves flexible, blue-green, 2.5-7 cm. long; cones reflexed; cultivated

P. silvestris

(b) Leaves stiff, yellow-green, 2.5-5.5 cm. long; cones pointing forward; native

P. banksiana

(2) Low branching shrub, 1-4 m. high; leaves 4-7 cm. long; cultivated

P. montana

Thúja—White Cedar, Arbor-vitae

(Gr. *thyia*, the arbor-vitae)

Pl. 1, fig. G

Native tree, often cultivated, with flat fragrant spray

T. occidentalis

Sabína—Savin, Red Cedar

(L. *herba sabina*, the Sabine plant)

Pl. 1, fig. H

1. Small upright tree

S. virginiana

2. Low creeping shrub

S. horizontalis

Juniperus—Juniper

(L. *juniperus*, the juniper)

Pl. 1, fig. I

Shrub with stiff needle-like leaves, and blue berries

J. communis

Taxaceae—Yew Family

Evergreen shrubs or trees; flowers dioecious or monoecious; staminate flowers cone-like, consisting of an axis bearing stamens; pistillate flowers not cone-like, much reduced, the ovules commonly solitary and exposed; seeds exposed, with a fleshy outer integument.

Taxus—Yew
(L. *taxus*, yew tree)
Pl. 1, fig. J

Low evergreen shrub; fruit a red berry

T. canadensis

Ginkgoales Ginkgo Order

Ginkgoaceae—Ginkgo Family

Deciduous tree; flowers dioecious; staminate flowers cone-like, consisting of an axis bearing numerous stamens; stamens stalked, furnished with two pendant pollen-sacs; pistillate flowers consisting of a naked stalk bearing at its summit a pair of ovules, each surrounded at its base with a collar-like growth; seeds drupe-like, the integuments consisting of an outer fleshy coat, a firm stony coat, and a thin papery layer. Consisting of only the following genus and species:

Ginkgo—Maiden-hair Tree

(The Chinese name)

Pl. 1, fig. K

Tree with fan-shaped leaves

G. biloba

Angiospermae Angiosperms

DICOTYLEDONS

Ranales Buttercup Order

Magnoliaceae—Magnolia Family

Trees or shrubs, with alternate leaves; sepals 3, petals 6-9, in whorls of 3, stamens many, pistils many, free or cohering; flowers apopetalous, hypogynous, and regular.

Magnolia—Cucumber-tree

(Named for the French botanist Magnol)

A cultivated tree, 15-20 m. high; flowers greenish yellow

M. acuminata

Ranunculaceae—Buttercup Family

Herbs or climbing shrubs; sepals 3-15, petals 0-15, stamens 5-many, pistil 1-many; flower apocarpous, apopetalous or apetalous, hypogynous, usually regular.

I. Flowers regular

1. Petals present

a. Petals spurred

Aquilegia

b. Petals not spurred

(1) Pistils several to many

(a) Pistils several, stalked in fruit

Coptis

(b) Pistils many, not stalked

x. Submerged aquatics; flowers white

Batrachium

y. Terrestrial plants; flowers yellow or greenish

(x) Flowers on a leafless stem, greenish

Myosurus

(y) Flowers on a leafy stem, yellow

Ranunculus

(2) Pistil 1

Actaea

2. Petals wanting, staminoids occasional

a. Sepals white or colored, petaloid

(1) Plant climbing or creeping; staminoids present

Clematis

(2) Plant not climbing or creeping

(a) Stem with a whorl of leaves, an involucre, below the flower

x. Styles long, plume-like

Pulsatilla

y. Styles short or none, not plume-like

(x) Involucre of 3 entire leaves close to flower

Hepatica

(y) Involucre some distance below the flower

m. Involucre leaflets many, simple, petioled

Syndesmon

n. Involucre leaflets 2-3, compound or cut

Anemone

(b) Stem leafy, without an involucre

x. Leaves simple; flowers yellow or greenish white

(x) Leaves entire, dentate; flowers bright yellow

Caltha

(y) Leaves deeply lobed, serrate; flowers greenish white

Hydrastis

y. Leaves compound; flowers white

Isopyrum

b. Sepals green, flowers dioecious

Thalictrum

II. Flowers irregular

Delphinium

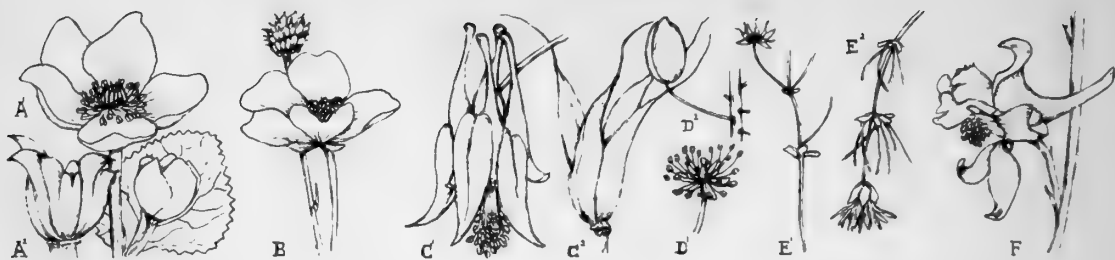


PLATE 2: A, *Caltha palustris*, 1, flower, 2, fruit; B, *Ranunculus septentrionalis*; C, *Aquilegia canadensis*, 1, flower, 2, fruit; D, *Actaea rubra*, 1, flower, 2, fruit; E, *Thalictrum dioecum*, 1, pistillate flower, 2, staminate flowers; F, *Delphinium albescens*.

Aquilégia—Columbine

(L. *aquila*, eagle, derivation doubtful)

Pl. 2, fig. C : 1, 2

- | | |
|---|----------------------|
| 1. Native perennial; flowers scarlet and yellow | <i>A. canadensis</i> |
| 2. Cultivated short-lived perennials | |
| a. Spurs short and hooked; flowers purple or white | <i>A. vulgaris</i> |
| b. Spurs long and slender, not hooked | |
| (a) Flowers blue, sepals wide spreading, 3-4 cm. long | <i>A. caerulea</i> |
| (b) Flowers yellow, sepals ascending, less than 3 cm. | <i>A. chrysantha</i> |

Cóptis—Goldthread

(Gr. *koptos*, cut, from the leaves)

Leaves trifoliate; flowers white; root yellow

C. trifolia

Batráchium—Frogwort

(Gr. *batrachion*, frogwort)

Leaves divided into thread-like segments, submerged

B. trichophyllum

Myosúrus—Mouse-tail

(Gr. *mys*, *myos*, mouse, *ura*, tail)

Sepals and petals minute; pistils many on a long axis

M. minimus

Ranúnculus—Buttercup, Crowfoot

(L. *ranunculus*, a little frog)

Pl. 2, fig. B

- | | |
|---|--|
| 1. Aquatic or mud plants with finely cut leaves | |
| a. Flower 7-14 mm. wide; lobes of submerged leaves not thread-like | <i>R. púrsii</i> |
| b. Flower 15-30 mm. wide; lobes of submerged leaves thread-like | <i>R. delphinifólius</i> |
| 2. Terrestrial plants | |
| a. Leaves all lobed or divided | |
| (1) Flowers less than 10 mm. wide, style hooked | <i>R. recurvátus</i> |
| (2) Flowers 15-25 mm. wide, style not hooked | |
| (a) Plant low, tufted and silky; leaflets narrow | <i>R. fasciculáris</i> |
| (b) Plant over 2 dm. tall; leaf segments broad | |
| • x. Plant very hairy | <i>R. hispídus</i> |
| y. Plant slightly hairy | <i>R. septentrionalis</i> |
| b. Basal leaves mostly not lobed or divided | |
| (1) Plants creeping, rooting at the nodes; basal leaves linear to spatulate | <i>R. flámmula</i> var. <i>réptans</i> |
| (2) Plants erect; basal leaves reniform or ovate | |
| (a) Basal leaves reniform; flowers less than 10 cm. | <i>R. abortívus</i> |
| (b) Basal leaves ovate; flowers 10-30 cm. | <i>R. ovális</i> |

Actáea—Baneberry

(Gr. *aktea*, elder)

Pl. 2, fig. D : 1, 2

- | | |
|--|---------------------------------------|
| 1. Pedicels slender; berries ovoid-ellipsoid | |
| a. Berries red | <i>A. rubra</i> |
| b. Berries white | <i>A. rubra</i> forma <i>neglecta</i> |
| 2. Pedicels thick; berries globular-ovoid, white | <i>A. álba</i> |

RANUNCULACEAE—BERBERIDACEAE

9

Clematis—Virgin's Bower

(Gr. *clematis*, a climbing plant)

Vine with opposite compound leaves and purple flowers

C. verticillaris

Pulsatilla—Pulsatilla, Pasque Flower

(L. *pulsatus*, beaten, perhaps meaning windflower)

Flowers pale purple, appearing before the leaves

P. hirsutissima

Hepatica—Liver-leaf

(Gr. *hepatikos*, liver-like)

1. Lobes of the leaves rounded or obtuse at apex

H. hepatica

2. Lobes acute at apex

H. acuta

Syndesmon—Rue Anemone

(Gr. *syn*, together, *desmos*, bond, i. e., uniting the rue and anemone)

Flowers several, erect, pink, surrounded by long-petioled leaflets

S. thalictroides

Anemone—Anemone, Windflower

(Gr. *anemone*, windflower)

1. Stem simple, one-flowered

a. Sepals 6-20; leaves with narrow segments

A. caroliniana

b. Sepals usually 5; leaves with broad segments

A. quinquefolia

2. Stem branched, several-flowered

a. Flower white, 2.5-4 cm. wide; stem leaves sessile

A. canadensis

b. Flower greenish, 1-2 cm. wide; stem leaves petioled

(1) Head of fruit cylindric

A. cylindrica

(2) Head of fruit oval

A. virginiana

Caltha—Marsh Marigold

(L. *caltha*, marigold)

Pl. 2, fig. A : 1, 2

Leaves heart-shaped; flowers many, bright yellow

C. palustris

Hydrastis—Golden Seal, Orange-root

(Of doubtful origin and meaning)

Leaves deeply palmately lobed; flower single, greenish white, sepals falling early

H. canadensis

Isopyrum—Isopyrum

(Gr. *isopyron*, name of a plant)

Leaves twice compound; flowers white

I. biternatum

Thalictrum—Meadow Rue

(Gr. *thaliktron*, meadow rue)

Pl. 2, fig. E : 1, 2

Leaves twice compound; flowers greenish, drooping

T. dioicum

Delphinium—Larkspur

(Gr. *delphinton*, larkspur)

Pl. 2, fig. F

Flowers whitish, with 5 sepals and 4 petals

D. albescens

Berberidaceae—Barberry Family

Herbs or shrubs, with alternate simple or compound leaves; flower parts usually in whorls of 3, sepals 6-9, stamens 6-18, pistil 1, simple; flowers apetalous, hypogynous, regular.

I. Spiny shrub

Berberis

II. Herbs

1. Leaves simple, deeply cut; flower white, single

Podophyllum

2. Leaves compound; flowers greenish, clustered

Caulophyllum

Berberis—Barberry

(Arabic name)

1. Leaves serrate; flowers and fruits in racemes

B. vulgaris

2. Leaves entire; flowers mostly one to each leaf cluster

B. Thunbergi

Podophyllum—May Apple

(Gr. *podos*, foot, *phyllon*, leaf)

Herbs with two large lobed leaves, with a solitary white flower

P. peltatum

MENISPERMACEAE—PAPAVERACEAE—FUMARIACEAE

Caulophýllum—Blue Cohosh

(Gr. **kaulos**, stalk, **phyllon**, leaf)

Herb with compound leaves and greenish 6-parted flowers

C. thalictroides

Menispermáceae—Moonseed Family

Twining vines with alternate leaves; sepals 4-8, petals 6-8, stamens 12-24, pistils 2-4; flower apocarpous, apopetalous, hypogynous, regular.

Menispermum—Moonseed

(Gr. **mene**, moon, **sperma**, seed)

Twining vine with ovate leaves and greenish flowers

M. canadense

Nymphaeaceae—Waterlily Family

Aquatic herbs; sepals 3-5, petals 5-many, stamens 5-many, pistils 1 compound or 3-many simple; flower apopetalous, hypogynous, regular.

Nymphaea—Yellow Pond Lily

Herb with floating and submerged leaves and yellow many-parted flower. *N. advena*

Brassicales Mustard Order

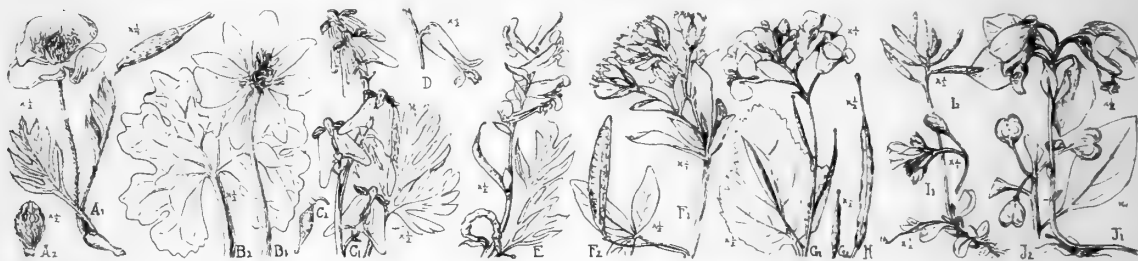


PLATE 3: A, *Papaver nudicaule*, 1, flower, 2, fruit; B, *Sanguinaria canadensis*, 1, flower, 2, fruit; C, *Bicuculla cucullaria*, 1, flower, 2, fruit; D, *Bicuculla canadensis*; E, *Capnoides aureum*; F, *Polanisia graveolens*, 1, flower, 2, fruit; G, *Brassica nigra*, 1, flower, 2, fruit; H, *Brassica juncea*; I, *Draba caroliniana*, 1, flower, 2, fruit; J, *Polygala paucifolia*, 1, flower, 2, fruit.

Papaveráceae—Poppy Family

Herbs with colored sap; sepals 2, petals 4-12, stamens many, ovary 1-celled; flower syncarpous, apopetalous, hypogynous, regular.

1. Flowers yellow or red; leaves pinnately lobed

Papaver

2. Flowers white; leaves palmately lobed

Sanguinaria

Papáver—Poppy

(Latin name of the poppy)

Pl. 3, fig. A : 1, 2

Leaves basal; stem 3-12 in. high; flowers 1-3 in. wide

P. nudicaule

Sanguinária—Bloodroot

(L. **sanguis**, blood, from the color of the sap)

Pl. 3, fig. B : 1, 2

Herb with red juice; leaf 5-9-lobed; flower single, white

S. canadensis

Fumariáceae—Fumitory Family

Herbs with dissected leaves; sepals 2, petals 4, 1 or 2 of them spurred, stamens 6, ovary 1-2-celled; flower syncarpous, apopetalous, hypogynous, zygomorphic.

I. Flower with two spurs

Bicuculla

II. Flower with one spur

Capnoides

Bicucilla—Bleeding Heart, Dutchman's Breeches, Squirrel Corn

(L. **bi-**, two, **cuculla**, cowl, from the two spurs)

Pl. 3, fig. C : 1, 2 and D

1. Flowers 2.5-3 cm. long, bright pink-red

B. spectabilis

2. Flowers 1-2 cm. long, white to pink

a. Flowers in a raceme, white

(1) Spurs prominent and spreading

B. cucullaria

(2) Spurs round and short, sack-like

B. canadensis

b. Flowers in a branched cluster, pink

B. eximia

Capnoides

(Gr. *capnodes*, smoke-like, from the color of some species)

Pl. 3, fig. E

- | | |
|---------------------------|------------------------|
| 1. Flowers pink | <i>C. sempervirens</i> |
| 2. Flowers yellow | |
| a. Flowers 4-5 mm. long | <i>C. flavulum</i> |
| b. Flowers 10-12 mm. long | <i>C. aureum</i> |

Capparidaceae—Caper Family

Herbs with compound leaves; sepals 4, petals 4, stamens 9-12, ovary 2-celled; flower syncarpous, apopetalous, hypogynous, regular.

Polanisia

(Gr. *polos*, pole, *anisos*, unequal, probably from the unequal stamens)

Pl. 3, fig. F : 1, 2

Strong-scented herbs; leaves trifoliate; flowers yellowish *P. graveolens*

Brassicaceae—Mustard Family

Herbs; sepals 4, petals 4, stamens 4 or 6, 2 shorter; ovary 2-celled; flower syncarpous, apopetalous, hypogynous, regular.

- | | |
|--|------------------|
| I. Pod globose, rounded or triangular | |
| 1. Pod globose | <i>Alyssum</i> |
| 2. Pod pear-shaped | <i>Camelina</i> |
| 3. Pod round and flat | |
| a. Seeds several in each cell of pod | <i>Thlaspi</i> |
| b. Seeds one in each cell of pod | <i>Lepidium</i> |
| 4. Pod triangular | <i>Bursa</i> |
| II. Pod oblong to linear | |
| 1. Flowers purplish | <i>Iodanthus</i> |
| 2. Flowers yellow | |
| a. Pods round | <i>Brassica</i> |
| b. Pods four-angled | <i>Barbarea</i> |
| c. Pods flattened | <i>Draba</i> |
| 3. Flowers white | |
| a. Plant aquatic | <i>Roripa</i> |
| b. Plant terrestrial | |
| (1) Flowers on a leafless stem | <i>Draba</i> |
| (2) Flowers on a leafy stem | |
| (a) Stem bulbous at base, leafy throughout | <i>Cardamine</i> |
| (b) Stem not bulbous at base | |
| x. Leaves entire to pinnately cut | <i>Arabis</i> |
| y. Leaves palmately divided | <i>Dentaria</i> |



PLATE 4: A, *Alyssum alyssoides*; B, *Thlaspi arvense*; C, *Lepidium apetalum*; D, *Bursa bursa-pastoris*; E, *Iodanthus pinnatifidus*; F, *Barbarea stricta*; G, *Roripa nasturtium*; H, *Cardamine bulbosa*; I, *Arabis hirsuta*; J, *Dentaria laciniata*.

Alyssum

(Gr. *alyssos*, curing madness, probably from supposed medical properties)

Pl. 4, fig. A

- | | |
|----------------------------------|----------------------|
| 1. Flowers white, 4 mm. wide | <i>A. maritimum</i> |
| 2. Flowers yellowish, 2 mm. wide | <i>A. alyssoides</i> |

BRASSICACEAE

Thláspi—Penny Cress

(Gr. **thlaspi**, cress, the seeds of which were crushed [**thlao**])

Pl. 4, fig. B

Leaves undivided; pod broadly winged

Th. arvense

Lepídium—Peppergrass

(Gr. **lepidion**, little scale, referring to the pods)

Pl. 4, fig. C

Leaves deeply cut; petals lacking

L. apetalum

Búrsa—Shepherd's Purse

(L. **bursa**, purse, referring to the pod)

Pl. 4, fig. D

Leaves deeply cut, often entire on the stem; flowers white

B. bursa-pastoris

Iodánthus—Purple Rocket

(Gr. **ion**, violet, **anthos**, flower, referring to the color)

Pl. 4, fig. E

Leaves mostly dentate; flowers purplish, petals with a long claw

I. pinnatifidus

Brássica—Mustard

(Latin name of the cabbage)

Pl. 3, fig. G : 1, 2 and H

1. Upper leaves clasping

a. Leaves smooth, glaucous, not eared at base

B. oleracea

b. Leaves hairy, eared at base

B. campestris

2. Upper leaves not clasping

a. Beak of pod sword-like; pods much constricted between seeds

B. álba

b. Beak round; pods not constricted between seeds

(1) Pods 2.5-5 cm. long; beak 6-15 mm. long

B. júncea

(2) Pods 1-1.5 cm. long; beak 2-10 mm. long

(a) Beak 2-4 mm. long

B. nígra

(b) Beak 8-10 mm. long

B. arvensis

Barbaréa—Yellow Rocket

(Named for Saint Barbara)

Pl. 4, fig. F

1. Pods spreading

B. barbaréa

2. Pods erect, appressed

B. stricta

Drába—Whitlow-grass

(Gr. **drabe**, name for a plant of the mustard family)

Pl. 3, fig. I : 1, 2

1. Flowers white; stem leafy at base only

D. caroliniána

2 Flowers yellow; stem leafy

D. nemorósa

Róripa—Water-cress

(Meaning of name unknown)

Pl. 4, fig. G

Leaves pinnate, of 3-9 leaflets; flowers white

R. nastúrtium

Cardámíne—Bitter Cress

(Gr. **kardamine**, a cresslike herb)

Pl. 4, fig. H

Basal leaves oval; stem leaves oblong; flowers white

C. bulbósa

Árabis—Rock Cress

(Referring to Arabia)

Pl. 4, fig. I

1. Pods ascending or erect

a. Basal leaves pinnatifid

A. lyráta

b. Basal leaves mostly dentate

(1) Pods ascending

(a) Seeds wing-margined

A. brachycárpa

(b) Seeds not wing-margined

A. dentáta

(2) Pods erect, appressed

A. hírsúta

2. Pods spreading, recurved

A. levigáta

Dentária—Toothwort

(L. *dentaria*, an herb that cures the toothache)

Pl. 4, fig. J

1. Stem leaves 3, the divisions lanceolate *D. laciniáta*
2. Stem leaves 2, the divisions ovate *D. diphýlla*

Polygaláceae—Milkwort Family

Herbs with entire leaves; sepals 5, 2 larger, petals 3, somewhat united, stamens 8, ovary 2-celled; flower syncarpous, slightly sympetalous, hypogynous, somewhat zygomorphic.

Polýgala—Milkwort

(Gr. *polys*, much, *gala*, milk)

Pl. 3, fig. J : 1, 2

1. Flowers many in a spike, white *P. sénega*
2. Flowers 1-4 in a raceme, rose-purple *P. paucifólia*

Violáceae—Violet Family

Low herbs with simple entire to deeply cut leaves; sepals 5, petals 5, stamens 5, ovary 1-celled, carpels 3; flower syncarpous, apopetalous, hypogynous, zygomorphic.

Viola—Violet

(L. *viola*, the violet)

1. Flowering stems not leafy
 - a. Leaves lobed or cut
 - (1) Petals bearded toward the base
 - (a) Lobes of the leaf broad, especially the middle one *V. palmáta*
 - (b) Lobes narrow, linear *V. pedatífida* *
 - (2) Petals not bearded *V. pedáta*
 - b. Leaves entire, crenate or dentate, sometimes cut at the base
 - (1) Petals blue or violet, rarely white
 - (a) Leaves reniform to ovate, base not cut
 - x. Plant glabrous
 - (x) Spur nearly as long as the petals *V. Selkirkii*
 - (y) Spur much shorter than the petals *V. papilionácea*
 - y. Plant hairy *V. sorória*
 - (b) Leaves mostly lanceolate, base often cut *V. sagittáta*
 - (2) Petals white, veins often purplish
 - (a) Leaves reniform, blade not decurrent
 - x. Plant glabrous *V. blánda*
 - y. Plant hairy *V. renifólia*
 - (b) Leaves linear to lanceolate, glabrous *V. lanceoláta*
2. Flowering stem leafy
 - a. Petals yellow *V. pubéscens*
 - b. Petals purple to white
 - (1) Spur short, blunt
 - (a) Stipules entire; flowers white or pinkish *V. canadénsis*
 - (b) Stipules toothed or cut; flowers purple
 - x. Plant smooth or nearly so *V. labradórica*
 - y. Plant hairy or puberulent *V. arenária*
 - (2) Spur long, acute *V. cornúta*
 - c. Petals many-colored *V. tricolor*

Sarraceniales Pitcher-Plant Order

Sarraceniáceae—Pitcher-Plant Family

Herbs with pitcher-like leaves; sepals 4-5, petals 5, stamens many, ovary 3-5-celled; flower syncarpous, apopetalous, hypogynous, regular.

Sarracénia—Pitcher-Plant

(Named for Dr. Sarracin, a Canadian botanist)

- Leaves erect, pitcher-like, winged; flowers purple *S. purpúra*

Caryophyllales Pink Order

Caryophyllaceae—Pink Family

Herbs with opposite entire leaves; sepals 4-5, petals 4-5, rarely none, stamens 4-10, ovary 1-celled, rarely 3-5-celled; flower syncarpous, apopetalous, hypogynous, regular.

I. Sepals united

1. Styles 2

Dianthus

2. Styles 3

Silene

3. Styles 4-5

Lychnis

II. Sepals separate

1. Petals entire

Moehringia

2. Petals deeply 2-cleft or parted

a. Pod ovoid to oblong, opening by valves

Alsine

b. Pod cylindric, opening by teeth

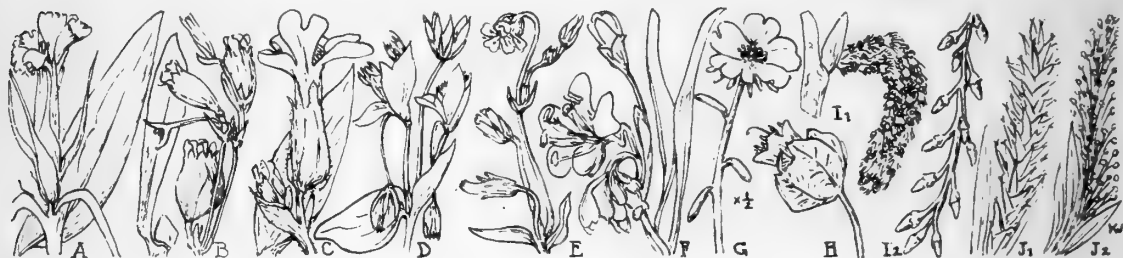
Cerastium

PLATE 5: A, *Dianthus barbatus*; B, *Silene antirrhina*; C, *Lychnis alba*; D, *Alsine media*; E, *Cerastium nutans*; F, *Claytonia virginica*; G, *Portulaca grandiflora*; H, *Allionia nyctaginea*; I, *Populus deltoides*, 1, flower, 2, fruit; J, *Salix fluviatilis*, 1, flower, 2, fruit.

Dianthus—Pink(Gr. *dio-*, of Jupiter, *anthos*, flower)

Pl. 5, fig. A

Petals toothed; flowers in a flat-topped cluster

*D. barbatus**Silene*—Catchfly(Gr. *Sellenos*, a companion of Bacchus)

Pl. 5, fig. B

1. Stem sticky about the nodes; flowers pink; day-flowering

S. antirrhina

2. Stem with sticky hairs all over; flowers white; night-flowering

*S. noctiflora**Lychnis*—Ragged Robin(Gr. *lychnos*, lamp, from the use of one species for wicking)

Pl. 5, fig. C

1. Flowers white, dioecious; petals 1-lobed

L. alba

2. Flowers red; petals 4-lobed

*L. flos-cuculi**Moehringia*—Sandwort

(Named for Moehring, a German naturalist)

Leaves oval or oblong; flowers single or few in a cluster, white

*M. lateriflora**Alsine*—Starwort(Gr. *alsine*, a kind of chickweed)

Pl. 5, fig. D

1. Leaves broad, ovate or oval

A. media

2. Leaves narrow, linear

*A. longifolia**Cerastium*—Chickweed(Gr. *keration*, a little horn, from the shape of the capsule)

Pl. 5, fig. E

1. Petals longer than the sepals

a. Flowers 4-5 mm. wide

C. longipeduncule

b. Flowers 8-10 mm. wide

C. arvense

2. Petals equalling or shorter than the sepals

a. Pedicels not longer than the calyx

C. viscosum

b. Pedicels at last much longer than the calyx

C. vulgatum

Portulacaceae—Purslane Family

Fleshy herbs; sepals 2, rarely 5, petals 4-5, stamens 4-30, ovary 1-celled; flower syncarpous, apopetalous, hypogynous, somewhat irregular.

- | | |
|--|------------------|
| 1. Flowers white to pink; stamens 5 | <i>Claytonia</i> |
| 2. Flowers mostly yellow or red; stamens more than 5 | <i>Portulaca</i> |

Portulaca—Purslane, Moss Rose

(*L. portulaca*, purslane)

Pl. 5, fig. G

- | | |
|---|-----------------------|
| 1. Flowers 5-6 mm. wide, yellow; leaves flat, wedge-shaped | <i>P. oleracea</i> |
| 2. Flowers 3-5 cm. wide, many-colored; leaves round, linear | <i>P. grandiflora</i> |

Claytonia—Spring Beauty

(Named for Clayton, an American botanist)

Pl. 5, fig. F

- | | |
|-------------------------------------|-----------------------|
| 1. Leaves linear | <i>C. virginica</i> |
| 2. Leaves ovate or ovate-lanceolate | <i>C. caroliniana</i> |

Polygonaceae—Buckwheat Family

Herbs with simple leaves; sepals 2-6, often somewhat united and petal-like, petals 0, stamens 2-9, ovary 1-celled, fruit an achene; flower syncarpous, apetalous, hypogynous, regular.

- | | |
|--|--------------|
| 1. Leaves round, 1 ft. or more across; petioles fleshy, sour | <i>Rheum</i> |
| 2. Leaves lanceolate or lance-oblong; petioles not fleshy | <i>Rumex</i> |

Rheum—Pie-plant, Rhubarb

(Gr. *rheon*, name of a medicinal plant)

- | | |
|-------------------------------|-----------------------|
| 1. Leaves deeply lobed | |
| a. Leaves rough | <i>R. palmatum</i> |
| b. Leaves hairy | <i>R. officinale</i> |
| 2. Leaves entire or nearly so | <i>R. rhabonticum</i> |

Rumex—Sheep Sorrel

(*L. rumex*, sorrel)

- | | |
|---|------------------------|
| 1. Leaves arrow-shaped, sour | <i>R. acetosella</i> |
| 2. Leaves lanceolate or lance-oblong, somewhat bitter | |
| a. Leaves curled at edges; valves of flower grain-bearing | <i>R. crispus</i> |
| b. Leaves hardly curled; usually 1 valve grain-bearing | <i>R. obtusifolius</i> |

Allionaceae—Four O'Clock Family

Herbs with simple leaves; sepals 5, united into a bright corolla-like tube, petals 9, stamens 3-5, ovary 1-celled, fruit 1-seeded, achene-like, enclosed in the base of the calyx; flower syncarpous, synsepalous, apetalous, apparently epigynous, usually regular.

- | | |
|--------------|------------------|
| 1. Stamens 3 | <i>Allionia</i> |
| 2. Stamens 5 | <i>Mirabilis</i> |

Allionia—Wild Four O'Clock

(Named for the Italian botanist, Allioni)

Pl. 5, fig. H

- | | |
|----------------------------|----------------------|
| Flowers pink; leaves ovate | <i>A. nyctaginea</i> |
|----------------------------|----------------------|

Mirabilis—Four O'Clock

(*L. mirabilis*, wonderful)

- | | |
|------------------------------------|------------------|
| Flowers many-colored; leaves ovate | <i>M. jalapa</i> |
|------------------------------------|------------------|

Salicaceae—Willow Family

Trees or shrubs with simple leaves; sepals 0, petals 0, stamens 1-60, ovary 1-celled, capsule 2-4-valved, seeds hairy; flowers dioecious, calyx and corolla both lacking.

- | | |
|---|----------------|
| I. Bracts entire; stamens usually less than 10 | <i>Salix</i> |
| II. Bracts cut or fringed; stamens usually more than 10 | <i>Populus</i> |

Salix—Willow

(*L. salix*, a willow-tree)

Pl. 5, fig. J : 1, 2

- | | |
|-------------------------------------|------------------|
| 1. Leaves and stipules with glands* | <i>S. lucida</i> |
|-------------------------------------|------------------|

*No attempt has been made to make a complete key to the willows, since it is impossible to determine them without the fruit.

2. Leaves and stipules without glands

a. Leaves glabrous on both sides when mature

(1) Leaves narrow, linear-lanceolate; low shrub

S. fluviatilis

(2) Leaves broader, lanceolate to ovate

(a) Leaves oblong-lanceolate, merely acute

S. discolor

(b) Leaves acuminate

S. nigra

b. Leaves pubescent or tomentose below

(1) Leaves oblong; low bog shrub

S. cándida

(2) Leaves broadly lanceolate, or oblanceolate

(a) Leaves elliptic to lanceolate

S. bebbiana

(b) Leaves oblanceolate

x. Leaves 5-10 cm. long

S. humilis

y. Leaves 2-5 cm. long

S. tristis

Pópulus—Poplar, Cottonwood, Aspen

(L. **populus**, a poplar-tree)

Pl. 5, fig. I : 1, 2

1. Crown cylindric; branches erect

P. nígra itálica

2. Crown rounded; branches spreading

a. Leaves with strongly flattened petioles

(1) Leaves coarsely wavy-toothed

P. grandidentáta

(2) Leaves more finely crenate-toothed

(a) Leaves round or ovate, short-pointed

P. tremuloides

(b) Leaves truncate at base, long-pointed

P. deltoídes

b. Leaves with round or channeled petioles

P. balsamífera

Malvales Mallow Order

Moráceae—Mulberry Family

Trees with simple leaves and usually a milky juice; sepals 4-5, petals 0, stamens 4-5, ovary 1-celled; flower syncarpous, apetalous, hypogynous.

Mórus—Mulberry

(Gr. **morea**, mulberry-tree)

Tree with milky sap and dentate leaves

M. rúbra

Ulmáceae—Elm Family

Trees with alternate simple serrate leaves; sepals 3-9, petals 0, stamens 3-9, ovary 1-celled, stigmas 2; flowers perfect to polygamous, syncarpous, apetalous, hypogynous.

I. Fruits winged, in clusters

Ulmus

II. Fruits globose, single

Celtis

Úlmus—Elm

(L. **ulmus**, elm-tree)

Pl. 6, fig. H : 1, 2, 3

1. Bud-scales densely brown hairy; samara not ciliate

U. fúlva

2. Bud-scales smooth; samara ciliate

a. Some of the twigs with corky lines; sides of fruit hairy

U. racemósa

b. None of the twigs with corky lines; sides of fruit smooth

U. americána

Céltis—Hackberry

(L. **celtis**, lotus-tree)

Pl. 6, fig. G : 1, 2, 3

Tree with ridged bark, and simple serrate leaves

C. occidentális

Geraniales Geranium Order

Geraniáceae—Geranium Family

Herbs with deeply cut leaves and perfect flowers; sepals 5, petals 5, stamens 5-10, ovary 5-celled; flower syncarpous, apetalous, hypogynous, regular.

I. Stamens with anthers 10

Geranium

II. Stamens with anthers 5

Erodium



PLATE 6: A, *Geranium maculatum*, 1, flower, 2, fruit; B, *Oxalis stricta*, 1, flower, 2, fruit; C, *Ruta graveolens*, 1, flower, 2, fruit; D, *Ptelea trifoliata*, 1, flower, 2, fruit; E, *Euphorbia corollata*; F, *Euphorbia glyptosperma*, 1, flower; 2, fruit; G, *Celtis occidentalis*, 1, staminate flower, 2, pistillate flower, 3, fruit; H, *Ulmus americana*, 1, cluster, 2, flower, 3, fruit.

Geranium—Geranium, Cranesbill

(Gr. *geranion*, cranes bill, geranium)

Pl. 6, fig. A: 1, 2

1. Flowers 2-3 cm. broad
2. Flowers 5-12 mm. broad

G. maculatum
G. bicknellii

Eródium—Storksbill

(Gr. *erodion*, heron)

Leaves pinnate, deeply cut; flowers pinkish

E. cicutarium

Oxalidaceae—Oxalis Family

Herbs with trifoliate leaves; sepals 5, petals 5, stamens 10-15, ovary 5-celled; flower syncarpous, apopetalous, hypogynous, regular.

Oxalis—Oxalis, Wood-sorrel

(Gr. *oxalis*, sorrel)

Pl. 6, fig. B: 1, 2

1. Flowers yellow, on leafy stems
2. Flowers white, pink or purple, on leafless stems
 - a. Flowers rose-purple, 3-12 together
 - b. Flowers pink, rarely white, single

O. stricta
O. violacea
O. acetosella

Rutaceae—Rue Family

Trees or shrubs, usually with compound leaves; sepals 4-5 or none, petals 4-5, stamens 4-10, pistils distinct, 2-5, or compound; flower apocarpous or syncarpous, apopetalous, hypogynous, regular.

1. Herbs
 - a. Flowers greenish yellow; petals usually 4
 - b. Flowers red-purple to white; petals 5
2. Small trees
 - a. Leaflets 3; branches smooth
 - b. Leaflets 9-11; branches prickly

Ruta
Dictamnus
Ptelea
Xanthoxylum

Rúta—Rue

(Latin name of the rue)

Pl. 6, fig. C: 1, 2

Bushy herb, 2-4 ft. high; flowers in corymbs

R. graveolens

Dictamnus—Dittany, Fraxinella

(The Greek name)

Aromatic sticky herb, 2-3 ft. high; flowers in a raceme

D. fraxinella

Ptélea—Hop-tree

(Greek name of the elm)

Pl. 6, fig. D: 1, 2

Small tree, 15-30 ft. high; fruits winged

P. trifoliata

Xanthoxylum—Prickly Ash

(Gr. **xanthos**, yellow, **xylon**, wood)

Small tree; leaves pinnate, leaflets 5-11; flowers greenish

X. americanum

Euphorbiaceae—Spurge Family

Herbs with monoecious flowers; sepals 0, petals 0. stamen 1, pistil 3-parted, several staminate and one pistillate flower enclosed by an involucre bearing glands often resembling petals.

Euphorbia—Spurge

(Gr. **euphorbion**, spurge)

Pl. 6, fig. E and F: 1, 2

1. Glands of the involucre with conspicuous petal-like appendages

E. corollata

2. Glands without petal-like appendages

E. cyparissias

Ericales Heath Order

Ericaceae—Heath Family

Herbs or shrubs with simple leaves, usually evergreen; sepals 4-5, petals 4-5, stamens 4-10. ovary 2-5-celled; flower syncarpous, apopetalous, sympetalous, hypogynous or epigynous, regular.

I. Low herbs with basal leaves only

Pirola

II. Leafy shrubs

1. Flower hypogynous, i. e., ovary within the corolla

a. Petals separate

Ledum

b. Petals united

(1) Corolla saucer-shaped

Kalmia

(2) Corolla bell-shaped or cylindric

(a) Erect shrubs

x. Stamen filaments bearded

Andromeda

y. Stamen filaments smooth

Chamaedaphne

(b) Trailing shrubs

x. Corolla salverform

Epigaea

y. Corolla cylindric

Arctostaphylus

2. Flower epigynous, i. e., ovary below the corolla

a. Petals nearly or quite free

Oxycoccus

b. Petals clearly united

(1) Ovary half-inferior; low trailing shrub

Chiogenes

(2) Ovary inferior; erect shrub

Vaccinium

Pirola—Wintergreen

(L. **pirum**, pear, referring to the leaves)

Pl. 7, fig. A

1. Flowers greenish white, style straight

P. secunda

2. Flowers rose or purple, style bent

P. asarifolia

Lédum—Labrador Tea

(Gr. **ledon**, an oriental shrub)

Evergreen shrub with simple entire leaves; flowers white

L. groenlandicum

Kálmia—Swamp Laurel

(Named for Peter Kalm)

Evergreen shrubs with purple flowers

K. glauca

Andrómeda—Moorwort

(Named from Andromeda)

Evergreen shrub with linear leaves; white flowers in umbels

A. polifolia

Chamaedaphne—Leatherleaf

(Gr. **chamae**, on the ground, **Daphne**)

Leaves oblong, scurfy, denticulate; flowers white, in 1-sided racemes

C. calyculata

Epigaea—Trailing Arbutus

(Gr. **epigeios**, on the earth)

Leaves oval; flowers rose-colored

E. repens

Arctostaphylus—Bearberry

(Gr. **arctos**, bear, **staphyle**, grape)

Pl. 7, fig. B: 1, 2

Leaves spatulate; flowers white or pinkish

A. uva-ursi

Oxycoccus—Cranberry

(Gr. *oxys*, sour, *kokkos*, berry)

1. Leaves oval or oblong, obtuse
2. Leaves ovate, acute

O. macrocarpus
O. oxycoccus

Chiogenes—Snowberry

(Gr. *chlon*, snow, *genes*, born)

Creeping evergreen shrubs with oval leaves; flowers white

C. hispida

PLATE 7: A, *Pirola secunda*; B, *Arctostaphylos uva-ursi*, 1, flower, 2, fruit; C, *Vaccinium pennsylvanicum*, 1, flower, 2, fruit; D, *Primula farinosa*; E, *Dodecatheon meadia*; F, *Trientalis americana*; G, *Androsace occidentalis*; H, *Forsythia suspensa*.

Vaccinium—Huckleberry, Blueberry, Cranberry

(L. *vaccinium*, blueberry)

Pl. 7, fig. C: 1, 2

1. Flowers mostly 4-parted and stamens 8
2. Flowers 5-parted and stamens 10
 - a. Leaves entire, pubescent beneath
 - b. Leaves serrulate, glabrous beneath

*V. uliginosum**V. canadense**V. pennsylvanicum*

Primulales Primrose Order

Primulaceae—Primrose Family

Herbs with simple leaves; sepals usually 5, petals 5, rarely wanting, stamens 5, opposite the corolla lobes, ovary 1-celled; flower syncarpous, sympetalous, hypogynous, regular.

I. Stem leafless

1. Flowers erect, salverform
2. Flowers inverted, corolla reflexed

*Primula**Dodecatheon*

II. Stem leafy

1. Flowers yellow, in an oblong spike
2. Flowers white
 - a. Leaves whorled at the top; corolla conspicuous
 - b. Leaves whorled at the joints; corolla inconspicuous

*Naumburgia**Trientalis**Androsace*

Primula—Primrose

(L. diminutive of *primus*, first)

Pl. 7, fig. D

1. Flowers rose to lilac
 - a. Leaves usually white-mealy beneath; scape 4-18 inches high
 - b. Leaves green on both sides; scape 1-6 inches high
2. Flowers yellow

*P. farinosa**P. mistassinica**P. acutis*

Dodecatheon—Shooting Star

(Gr. *dodekatheon*, a medicinal plant)

Pl. 7, fig. E

Leaves basal, spatulate; flowers purple to white

D. meadia

Trientalis—Starflower

(L. *trientalis*, a third of a foot)

Pl. 7, fig. F

Leaves 5-10 at the summit; flowers white or pink

T. americana

Andrósace—Androsace

(Gr. **androsakes**, a kind of plant)

Pl. 7, fig. G

Low much-branched herb; flowers very small, white

A. occidentális

Gentianales Gentian Order

Menyanthaceae—Buckbean Family

Aquatic or marsh herbs with trifoliate leaves; sepals 5, petals 5, stamens 5, ovary 1-celled; flower syncarpous, sympetalous, hypogynous, regular.

Menyanthes—Buckbean

(Gr. **menanthes**, moon-flower)

Leaves trifoliate, leaflets entire; flowers white or purple

M. trifoliáta

Oleaceae—Olive Family

Trees or shrubs with simple or pinnate leaves; sepals 4, petals 2-4 or none, stamens 2-4, ovary 2-celled; flowers perfect to dioecious, syncarpous, often apetalous, hypogynous, regular.

1. Petals none; trees

Fraxinus

2. Petals present; shrubs

a. Flowers yellow

Forsythia

b. Flowers not yellow

(1) Flowers lilac, rarely white; petals small, united

Syringa

(2) Flowers white; petals 1 in. long, nearly free

Chionanthus

Fraxinus—Ash

(L. **fraxinus**, ash-tree)

1. Lateral leaflets sessile

F. nígra

2. Lateral leaflets stalked

a. Wing mostly at the end of fruit

F. americana

b. Wing extending down the sides of fruit

(1) Leaves and twigs velvety

F. pennsilvánica

(2) Leaves and twigs smooth

F. lanceoláta

Forsythia—Forsythia

(Named for Forsyth, an English horticulturist)

Pl. 7, fig. H

1. Corolla golden yellow; leaves ovate

F. suspénsa

2. Corolla greenish yellow; leaves lanceolate

F. viridíssima

Syringa—Lilac

(Gr. **syrinx**, tube, of doubtful application)

1. Corolla much longer than calyx

a. Flower clusters from lateral buds

(1) Leaves cordate or truncate at base

S. vulgáris

(2) Leaves narrowed toward base

S. pérsica

b. Flower clusters usually on terminal leafy branches

S. villósa

2. Corolla little longer than calyx

S. amurénsis

Chionanthus—Fringe Tree

(Gr. **chion**, snow, **anthos**, flower, from the color)

Flowers with long ribbon-like petals

C. virgínica

Polemoniales Phlox Order

Polemoniaceae—Phlox Family

Herbs with entire to dissected leaves; sepals 5, petals 5, stamens 5, alternate with the corolla lobes; ovary usually 3-celled; flowers syncarpous, sympetalous, hypogynous, regular.

I. Leaves simple

1. Leaves opposite; flowers large

Phlox

2. Leaves alternate; flowers minute

Collomia

II. Leaves pinnate

Polemonium



PLATE 8: A, *Phlox divaricata*, 1, flower, 2, fruit; B, *Hydrophyllum virginicum*; C, *Macrocalyx nyctelea*, 1, flower, 2, fruit; D, *Atropa belladonna*; E, *Hyoscyamus niger*; F, *Lithospermum canescens*, 1, flower, 2, fruit; G, *Mertensia paniculata*; H, *Myosotis palustris*.

Phlóx—Phlox, Sweet William

(Gr. **phlox**, a flame)

Pl. 8, fig. A: 1, 2

1. Leaves linear-lanceolate; flowers pink or purple
2. Leaves oblong-ovate; flowers blue or bluish

P. pilósa

P. divaricáta

Collómia—Collomia

(Gr. **kolloma**, glue)

Leaves linear-lanceolate, entire; flowers purplish

C. lineáris

Polemónium—Polemonium

(Gr. **polemonion**, name of a plant)

Stem reclining; leaflets 3-9; flower blue

P. réptans

Hydrophylláceae—Waterleaf Family

Herbs, usually hairy; sepals 5, petals 5, stamens 5, alternate with the petals, ovary 1-2-celled; flower syncarpous, sympetalous, hypogynous, regular.

I. Stamens exserted

Hydrophyllum

II. Stamens included, calyx very large

Macrocalyx

Hydrophýllum—Waterleaf

(Gr. **hydro-**, water, **phyllon**, leaf)

Pl. 8, fig. B

1. Small appendages between the sepals
2. Small appendages lacking

H. appendiculátum

H. virgínicum

Macrócalyx—Macrocalyx

(Gr. **makros**, large, **kalyx**, calyx)

Pl. 8, fig. C: 1, 2

Leaves deeply pinnatifid; flowers white or bluish

M. nyctélea

Solanáceae—Potato Family

Herbs or shrubs, with alternate, usually strong-scented leaves; sepals 5, united, petals 5, united, ovary usually 2-celled, sometimes 3-5-celled, stigma 1, sometimes 2-lobed, fruit a berry or capsule; flower syncarpous, sympetalous, hypogynous, regular or sometimes irregular.

1. Leaves ovate, entire; corolla and berry purple
2. Leaves clasping, toothed; corolla yellowish

Atropa

Hyoscyamus

Átropa—Belladonna

(Named for Atropos, one of the Fates)

Pl. 8, fig. D

Flowers single or in pairs

A. belladónna

Hyoscyámus—Henbane

(Gr. **hyos**, hog, **kyamos**, bean)

Pl. 8, fig. E

Flowers in 1-sided spikes

H. níger

Boragináceae—Borage Family

Herbs with mostly entire and hairy leaves; sepals 5, petals 5, stamens 5, alternate with the petals, ovary usually of 4 nutlets; flower syncarpous, sympetalous, hypogynous, mostly regular.

BORAGINACEAE—SCROPHULARIACEAE

- I. Nutlets armed with barbed prickles *Lappula*
- II. Nutlets not armed *Onosmodium*
1. Corolla tubular, lobes erect *Lithospermum*
2. Corolla funnelform, lobes spreading *Mertensia*
- a. Flowers yellow or white
- b. Flowers blue-purple
3. Corolla salverform *Myosotis*
- a. Flowers blue *Cynoglossum*
- b. Flowers red-purple
- Láppula—Stickseed
(*L. lappula*, a little bur)
- Leaves entire, rough-hairy; flowers blue *L. láppula*
- Onosmódium—Gromwell
(Gr. *onosma*, a borage)
- Stem bristly; leaves entire, rough; flowers yellowish white *O. mólle*
- Lithospérmum—Puccoon
(Gr. *lithos*, stone, *sperma*, seed)
Pl. 8, fig. F: 1, 2
1. Flowers bright yellow or orange
- a. Corolla lobes entire
- (1) Rough-hairy, corolla tube bearded at base within *L. gmélini*
- (2) Smooth-hairy, corolla tube not bearded *L. canéscens*
- b. Corolla tubes toothed or fringed *L. angustifólium*
2. Flowers white or yellowish
- a. Flowers white; leaves lanceolate *L. arvénse*
- b. Flowers yellowish; leaves ovate *L. latifólium*
- Merténsia—Lungwort
(Named for Mertens, a German botanist)
Pl. 8, fig. G
- Leaves thin, ovate; flowers blue-purple *M. paniculáta*
- Myosótis—Forget-me-not
(Gr. *mys*, mouse, *otis*, ear, from the hairy leaves)
Pl. 8, fig. H
1. Flowers 2-3 mm. wide *M. arvénsis*
2. Flowers 6-8 mm. wide *M. palístris*
- Cynoglóssum—Hound's Tongue
(Gr. *kynos*, dog, *glossa*, tongue)
- Leaves spatulate to lance-oblong, downy *C. officinále*

Scrophulariales Snapdragon Order

Scrophulariáceae—Snapdragon Family

Mostly herbs with simple leaves; sepals 5, petals 5, stamens 2-5, ovary 2-celled; flower syncarpous, sympetalous, hypogynous, mostly irregular, i. e., 2-lipped.

- I. Leaves deeply cut; flower hooded *Pedicularis*
- II. Leaves entire or toothed
1. Corolla 2-4-lobed
- a. Corolla usually 2-lobed, flowers in a dense spike *Synthyris*
- b. Corolla 4-lobed, flowers in racemes *Veronica*
2. Corolla 5-lobed, 2-lipped
- a. Flowers with large red or yellowish bracts *Castilleja*
- b. Flowers without colored bracts
- (1) Corolla inflated, flower small, yellowish brown *Scrophularia*
- (2) Corolla tubular, flower white, purple or yellow, conspicuous
- (a) Fifth stamen present as a sterile filament *Pentstemon*
- (b) Fifth stamen entirely lacking
- x. Corolla closed, spurred *Linaria*
- y. Corolla open, not spurred *Digitalis*

Pediculáris—Pedicularis

(L. **pedicularis**, lousewort)

Pl. 9, fig. A

Leaves pinnately parted; flowers yellow

P. canadensis

Synthyris—Synthyris

(Gr. **synthyris**, doors together)

Leaves ovate; flowers greenish yellow

S. bullii

Verónica—Speedwell

(Named for Saint Veronica)

Pl. 9, fig. B: 1, 2

1. Flowers solitary, white

V. peregrina

2. Flowers in racemes, blue or bluish

V. americana

Castilléia—Painted-cup

(Named for Castillejo, a Spanish botanist)

Pl. 9, fig. C

1. Bracts greenish

C. sessiliflora

2. Bracts red

C. coccinea

Scrophulária—Figwort

Coarse herb with square stem and toothed leaves

S. leporélla

Pentstémon—Beard-tongue

(Gr. **pente**, five, **stemon**, stamen)

Pl. 9, fig. D

1. Flowers white

P. albidus

2. Flowers purple to blue

P. hirsutus

a. Corolla throat nearly filled with hairs

b. Corolla throat open

(1) Corolla an inch or less long

P. gracilis

(2) Corolla 2 inches long

P. grandiflorus

Linária—Butter-and-Eggs

(L. **linum**, flax, from the resemblance)

Pl. 9, fig. E: 1, 2

1. Plant creeping; leaves round; flowers blue

L. cymbalaria

2. Plant erect; leaves lance-linear; flowers yellow

L. vulgaris

Digitalis—Foxglove

(L. **digitalis**, finger-like, from the corolla)

Flowers purple, in a spike

D. purpurea

Orobancháceae—Broom-rape Family

Leafless parasitic herbs; sepals 5, petals 5, stamens 4, of two lengths, ovary 1-celled; flower syncarpous, sympetalous, hypogynous, irregular.

Thalésia—Broom-rape

(Named for the Greek philosopher, Thales)

Stalks 1-flowered; flowers white to violet

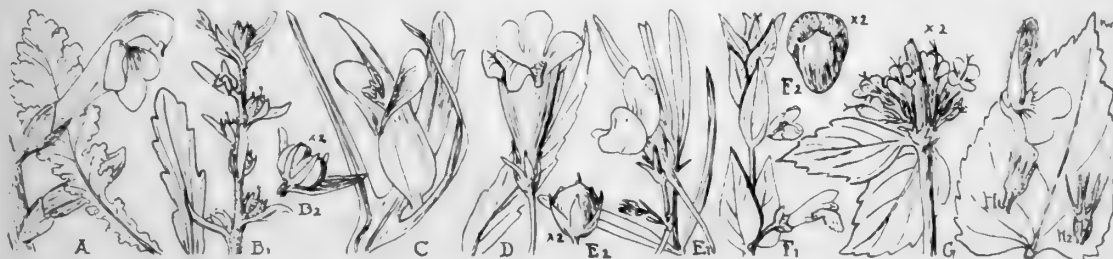
T. uniflora

PLATE 9: A, *Pedicularis canadensis*; B, *Veronica peregrina*, 1, flower, 2, fruit; C, *Castilleja coccinea*; D, *Pentstemon gracilis*; E, *Linaria vulgaris*, 1, flower, 2, fruit; F, *Scutellaria parvula*, 1, flower, 2, fruit; G, *Mentha piperita*; H, *Lamium album*, 1, flower, 2, fruit.

Lamiales Mint Order

Lamiaceae—Mint Family

Aromatic herbs, usually with opposite leaves and 4-angled stems; sepals 5, petals 5, stamens 2 or 4, ovary 4-lobed; flower syncarpous, sympetalous, hypogynous, mostly irregular.

1. Corolla regular, 4-cleft

Mentha

2. Corolla irregular, 2-lipped

a. Leaves round; trailing herbs

Glechoma

b. Leaves linear to ovate

(1) Leaves linear, fragrant; flowers small, pinkish

Hedeoma

(2) Leaves lance-ovate; flowers blue

Scutellaria

(3) Leaves ovate; flowers large, white

Lamium

Méntha—Mint

(The Latin name)

Pl. 9, fig. G

Leaves lanceolate, petioled; flowers in spikes

M. piperita

Glechóma—Ground Ivy

(Gr. *glechon*, pennyroyal)

Stems creeping; leaves round; flowers blue

G. hederácea

Hedeóma—Pennyroyal

(Gr. *hedyosmos*, fragrant)

Leaves linear, entire, hispid; flowers clustered, bluish

H. hispida

Scutellária—Skullcap

(L. *scutella*, a salver)

Pl. 9, fig. F: 1, 2

Leaves ovate to lanceolate; flowers solitary, blue

S. párvula

Lámium—Dead Nettle

(Gr. *lamia*, throat, from the gaping corolla)

Pl. 9, fig. H: 1, 2

Flowers white; leaves ovate, petioled

L. álbum

Rosales Rose Order

Rosaceae—Rose Family

Herbs, shrubs or trees with alternate simple or compound leaves; sepals 5, often with 5 bracteoles alternating with them, petals 5, or rarely 0, stamens 5-many, pistils 1-many, simple and free or with the ovaries united into a 2-10-celled compound ovary; flower apocarpous or syncarpous, apopetalous, hypogynous or mostly perigynous, regular.

I. Shrubs or trees

1. Pistils several to many

a. Pistils free

(1) Pistils on a raised receptacle; fruit an aggregation of drupelets *Rubus*

(2) Pistils in a cup- or urn-shaped receptacle

(a) Fruit fleshy, carpels more than 5, becoming bony nutlets *Rosa*

(b) Fruit dry, carpels 3-5, becoming many-seeded follicles *Spiraea*

b. Pistils several, usually more or less united

(1) Leaves compound, pinnate

Sorbus

(2) Leaves simple

(a) Flowers large, scarlet, white or rose color, in simple, umbel-like cymes or few-flowered clusters

x. Flowers scarlet, ovules numerous in each cell; low, spiny shrub

Cydonia

y. Flowers rose color, ovules 1-2 in each cell; trees

Malus

(b) Flowers smaller, numerous, white, in racemes or compound cymes

x. Flowers in simple racemes, ovary becoming 10-celled

Amelanchier

- y. Flowers in compound cymes, ovary 2-5-celled
 - (x) Styles separate to the base; ripe carpels bony; shrubs or trees, mostly armed
 - m. Tall thorny shrubs or trees; ovule 1 in each cell or 2 unlike *Crataegus*
 - n. Low shrub; 2 ovules in each cell, alike *Cotoneaster*
 - (y) Styles united at the base; low unarmed shrub *Aronia*

2. Pistil one *Prunus*

II. Herbs

- 1. Flower nodding, rose-purple *Geum*
- 2. Flowers erect, yellow or white *Potentilla*
 - a. Flowers yellow
 - b. Flowers white
 - (1) Leaves basal; sepals seemingly 10 *Fragaria*
 - (2) Leaves on the stem; sepals 5 *Rubus*

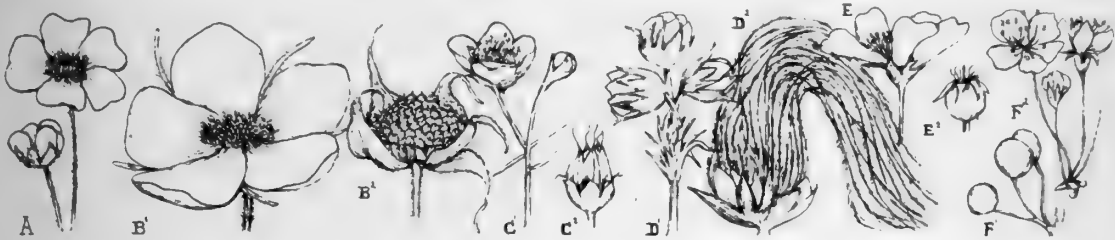


PLATE 10: A, *Potentilla canadensis*; B, *Rubus parviflorus*, 1, flower, 2 fruit; C, *Spiraea Van Houttei*, 1, flower, 2, fruit; D, *Geum ciliatum*, 1, flower, 2, fruit; E, *Amelanchier canadensis*, 1, flower, 2, fruit; F, *Prunus pennsylvanica*, 1, flowers, 2, fruit.

Rubus—Blackberry, Raspberry

(L. *rubus*, bramblebush)

Pl. 10, fig. B: 1, 2

- 1. Stems herbaceous, trailing, unarmed *R. triflorus*
- 2. Stems shrubby, more or less prickly *R. villösus*
 - a. Stems trailing or at least prostrate towards the ends *R. allegheniensis*
 - b. Stems erect or arched ascending
 - (1) Prickles stout; petals much exceeding the sepals *R. strigosus*
 - (2) Prickles small; sepals and petals about the same length *R. occidentalis*
- x. Young stems with weak glandular bristles; fruit red
- y. Young stem with hooked prickles; fruit black

Rosa—Rose

(L. *rosa*, a rose)

- 1. Leaflets 5-7; flower branches unarmed or nearly so *R. blanda*
- 2. Leaflets 7-11; stems all densely prickly *R. arkansana*

Spiraea—Spiraea

(Gr. *spiraea*, perhaps originally from the twisted pods)

Pl. 10, fig. C: 1, 2

- 1. Corymbs terminating short leafy shoots; leaves lobed *S. Van Houttei*
- 2. Umbels sessile, subtended by a few small leaves; leaves not lobed *S. arguta*

Sorbus—Mountain Ash

(L. *sorbus*, service tree)

- 1. Leaflets acuminate, smooth on both sides; fruit 4-6 mm. long *S. americana*
- 2. Leaflets more or less obtuse, thicker; fruit 6-12 mm. long
 - a. Leaflets pubescent below, especially along the veins; native *S. sambucifolia*
 - b. Leaflets always more or less pubescent on both sides; introduced *S. aucuparia*

Cydónia—Quince

(L. *cydonia*, quince, from Cydonia, a town of Crete)

Flowers typically scarlet red, in 2-6-flowered clusters, appearing before the leaves

C. japonica

Málus—Apple

(L. *malus*, apple-tree)

1. Leaves and outer surface of sepals glabrate; cultivated shrubs or trees

a. Leaves thick; flowers very numerous; fruit 1-1.2 cm. or less, red

M. floribunda

b. Leaves thin; flowers less numerous; fruit 1.5-2.5 cm., yellow

M. baccata

2. Leaves and outer surface of sepals persistently tomentose; native or cultivated trees

a. Leaves rounded or cordate at the base; pome 5-10 cm. in diameter; cultivated

M. silvestris

b. Leaves mostly narrowed at the base; pome 2.5-3.5 cm. in diameter; native

M. ioensis

Ameláncier—June-berry, Service-berry

(The Savoy name)

Pl. 10, fig. E : 1, 2

1. Petals narrowly oblong, 14-25 mm. long; leaves finely and sharply serrate

A. canadensis

2. Petals oblong to obovate, 4-12 mm. long

a. Flowers in 5-many-flowered racemes; leaves obtuse or cordate at the base

(1) Leaves oblong, finely serrate; blossoming April 10-May 15

A. oblongifolia

(2) Leaves oval; blossoming May 15-25

A. spicata

b. Flowers 1-4, in terminal clusters; leaves acute or somewhat wedge-shaped at the base

A. oligocarpa

Crataégus—Thorn, Hawthorn

(Gr. *krataegos*, a thorn)

1. Leaves ovate, elliptic-ovate or nearly orbicular in outline, mostly lobed, more than 4 cm. wide

a. Leaves cordate to truncate at the base, densely tomentose below; fruit pubescent

C. mollis

b. Leaves cuneate at the base, glabrous or pubescent; fruit glabrous

(1) Leaves ovate-orbicular, coarsely serrate, glabrous on both sides

C. rotundifolia

(2) Leaves rhombic-elliptic, pubescent at least on the veins beneath, coarsely serrate

(a) Leaves coriaceous, dark green and shining above

C. macracantha

(b) Leaves thin, dull green, pubescent and with impressed veins above

C. tomentosa

2. Leaves obovate, oblanceolate, or spatulate, slightly or not all lobed, mostly 2-4 cm. wide

a. Leaves dull, gray-green, pubescent

C. punctata

b. Leaves bright green, glabrous and shining

C. crus-galli

Cotoneáster—Fire Thorn

(Name New Latin, signifying quince-star)

Flowers cymose, small and white; leaves leathery and sometimes evergreen

C. acutifolia

Arónia—Chokeberry

(L. *aronia*, formed from *aria*, the beam-tree)

Flowers white or pink, in terminal compound cymes

A. nigra

Prúnus—Plum, Cherry

(Classical L. name of the plum-tree)

Pl. 10, fig. F : 1, 2

1. Flowers single (not filled) Cherries and Plums

a. Large shrubs or trees

(1) Flowers in racemes, terminating the season's growth

(a) Small tree or large shrub; leaves broadly ovate

P. virginiana

(b) Large tree; leaves narrowly ovate or lanceolate

P. serotina

- (2) Flowers in scaly umbels or corymbs, expanding with or before the leaves

- (a) Branches usually thorny or armed; fruit sub-globose, borne singly Plums

- x. Teeth of leaves obtuse, gland-tipped; stone flat *P. nigra*
y. Teeth of leaves acute, bristle-tipped; stone round *P. americana*

- (b) Branches not thorny or armed; fruit globose or sub-globose Cherries

- x. Flowers in corymbs, small, petals 4-6 mm. long; fruit 3-6 mm. *P. pennsylvanica*
y. Flowers in umbels, large, petals 8-12 mm. long; fruit 8-15 mm. *P. cerasus*

- b. Dwarf shrubs (1-4 ft.), with narrow leaves

- (1) Shrub with wand-like branches; leaves thin *P. pumila*
(2) Bushy shrub; leaves thick *P. besseyi*

2. Flowers double or filled Flowering Almonds and Plums

- a. Leaves lanceolate; flowers 2-3 cm. broad *P. japonica*
b. Leaves ovate, mostly 3-lobed; flowers 3-5 cm. broad *P. triloba*

Geum—Avens

(L. **geum**, avens)

Pl. 10, fig. D : 1, 2

1. Leaflets 1-9; style jointed *G. rivale*
2. Leaflets many; style not jointed *G. ciliatum*

Potentilla—Cinquoil

(L. **potens**, powerful)

Pl. 10, fig. A

1. Leaf pinnate, smooth above, quite hairy below *P. anserina*
2. Leaves palmately 5-foliate *P. canadensis*

Fragaria—Strawberry

(L. **fragum**, strawberry plant)

1. Leaves thick, dark green; berry round; nutlets sunken in pits *F. virginiana*
2. Leaves thin, light green; berry long; nutlets projecting *F. americana*

Fabaceae—Pea Family

Herbs, shrubs, vines or trees with alternate mostly compound leaves; sepals 4-5, petals 5, rarely fewer, stamens 10, usually in two groups, pistil 1, simple, 1-many-seeded; flower apopetalous, hypogynous or perigynous, irregular. The typical flower of this family, e. g., the pea, has the sepals united into an irregular cup. The petals are of three forms, an upper odd petal (standard), two lateral spreading petals (wings) and the two lower ones (keel) more or less united and enclosing the stamens and pistils. The stamens are usually united by their filaments in a group of nine, the tenth stamen being free.

I. Trees and shrubs

1. Thorny trees; flowers white, in drooping racemes *Robinia*
2. Thornless shrubs; flowers yellow or purple
a. Flowers yellow, 1-5 in a cluster *Caragana*
b. Flowers purple, in dense erect spikes, only 1 petal *Amorpha*

II. Herbs

1. Leaves pinnate
a. Leaflets more than 3; plants perennial
(1) Leaves tendril-bearing at the tip
(a) Style round, hairy-tufted at the tip *Vicia*
(b) Style flattened, bearded along the inner face *Lathyrus*
(2) Leaves not tendril-bearing
(a) Keel prolonged into a tip *Aragalus*
(b) Keel obtuse *Astragalus*
b. Leaflets 3; plants biennial *Melilotus*

2. Leaves palmate

a. Flowers in heads or interrupted, bracted spikes

- (1) Plants silvery gray; leaflets 3-5; flowers purple, in interrupted spikes

Psoralea

- (2) Plants not silvery gray; flowers pink, white or yellow, in heads

Trifolium

b. Flowers in elongated spikes

- (1) Leaflets 7-11; flowers generally blue

Lupinus

- (2) Leaflets 3; flowers cream color

Baptisia

Robinia—Locust

(Named for the brothers Robin)

Flowers white and fragrant, in drooping racemes

R. pseudacácia

Caragána—Pea-tree

(Tatar name of original species)

1. Small tree; leaflets 8-18

C. arboréscens

2. Shrub; leaflets 4, almost palmate

C. digitáta

Amórpha—False Indigo

(Gr. *a-*, without, *morphe*, form, i.e., unlike the pea)

1. Tall shrub, 1-3 m.; leaflets 2-5 cm. long

A. fruticósa

2. Low shrub, 3 dm. or less

A. nána

Vicia—Vetch

(L. *vicia*, a vetch)

1. Racemes dense, 1-sided, 15-20-flowered

V. crácca

2. Racemes loose, 1-20-flowered

- a. Leaflets ovate, about one-third as wide as long

V. americána

- b. Leaflets linear, about one-tenth as wide as long

V. lineáris

Láthyrus—Sweet Pea

(Gr. *lathyros*, a kind of pulse)

1. Stipules broad and leaf-like

- a. Flowers yellowish white

L. ochroleúcus

- b. Flowers pink-purple

L. marítimus

2. Stipules narrow, much smaller than the leaflets

- a. Leaflets broadly ovate, 15-20 mm. wide

L. venósus

- b. Leaflets lanceolate, 5-10 mm. wide

L. palústris

Arágalus—Loco Weed

(Name doubtful)

Leaves all basal; flowers purple

A. lambérti

Astrágalus—Ground Plum, Buffalo Pea

(Gr. *astragalos*, a kind of pulse)

1. Flowers violet-purple

- a. Flowering in April and early May; calyx not black hairy

A. crassicárpus

- b. Flowering about June first; calyx markedly black hairy

A. hypoglóttis

2. Flowers yellow; plant long hairy

A. lotiflórus

Melilótus—Sweet Clover

(Gr. *meli*, honey, *lotos*, a plant)

Flowers yellow, in long slender racemes

M. officinális

Psorálea—Psoralea

(Gr. *psoralecs*, scurfy, from the glands or dots)

Plants densely silvery pubescent; flowers purple

P. argophýlla

Trifólium—Clover

(L. *tri-*, three, *folium*, leaf)

1. Flowers yellow, heads 8-12 mm. in diameter

T. procúmbens

2. Flowers white to pink, heads more than 12 mm. in diameter

- a. Stems creeping; flowers white or pinkish

T. répens

- b. Stems erect or ascending

- (1) Heads sessile, involucrate; flowers deep pink

T. praténse

- (2) Heads stalked, not involucrate; flowers white or pinkish

T. híbridum

Lupinus—Lupine

(L. **lupinus**, lupine)

Herbs with erect racemes of showy blue flowers

L. perennis

Baptisia—False Indigo

(Gr. **baptizo**, to dye, used as indigo)

1. Plants pubescent; stipule leaf-like
2. Plants glabrous and succulent; stipules linear

*B. bracteata**B. leucantha*

Saxifragaceae—Saxifrage Family

Herbs or shrubs; sepals 5, rarely 4, petals 5, rarely none, stamens 5-10, or many, ovary 1-several-celled; flowers syncarpous, apopetalous, perigynous to epigynous, regular or irregular.

I. Herbs

1. Petals present

- a. Stamens 5

Heuchera

- b. Stamens 10

- (1) Petals entire

Saxifraga

- (2) Petals fringed

Mitella

2. Petals absent

Chrysosplenium

II. Shrubs

1. Stamens 5, ovary 1-celled

Ribes

2. Stamens 20-40, ovary 3-5-celled

Philadelphus

PLATE 11: A. *Saxifraga pennsylvanica*. 1. flower, 2. fruit; B. *Mitella diphylla*. 1. flower, 2 and 3. fruit; C. *Heuchera hispida*. 1. fruit, 2. flower; D. *Chrysosplenium americanum*. 1. flower, 2. fruit; E. *Ribes floridum*. 1. flowers, 2. fruits; F. *Philadelphus grandiflorus*. 1. flower, 2. fruit.

Heuchera—Alum Root

(Named for the botanist Heucher)

Pl. 11, fig. C : 1, 2

Leaves long-petioled, mostly basal; flowers slightly irregular

H. hispida

Saxifraga—Saxifrage

(L. **saxifragus**, stone-breaking)

Pl. 11, fig. A : 1, 2

1. Swamp plant with entire basal leaves; flowers greenish
2. Dry land plant; leaves dentate; flowers white

*S. pennsylvanica**S. virginicensis*

Mitella—Mitrewort

(Gr. **mitra**, headdress)

Pl. 11, fig. B : 1, 2, 3

1. Flowering stem with two opposite leaves below the flower
2. Flowering stem naked or a small leaf below the flower

*M. diphylla**M. nuda*

Chrysosplenium—Golden Saxifrage

(Gr. **chrysos**, golden, **splenion**, spleenwort)

Pl. 11, fig. D : 1, 2

Low herbs with opposite leaves and inconspicuous flowers

C. americanum

SAXIFRAGACEAE—ONAGRACEAE—RHAMNACEAE

Ribes—Gooseberry, Currant

(The Arabic name)

Pl. 11, fig. E : 1, 2

1. Stems with spines or prickles or both
 - a. Flowers 1-4, rarely 5 Gooseberries
 - (1) Cultivated shrub, sometimes escaped; spines stout, usually in 3's *R. grossulária*
 - (2) Native shrubs; spines mostly slender
 - (a) Calyx lobes shorter than the tube; berries mostly bristly *R. cynósbati*
 - (b) Calyx lobes as long or longer than the tube; berries smooth
 - x. Calyx 9-12 mm. long, stamens long-exserted *R. grácile*
 - y. Calyx 5-7 mm. long, stamens not exceeding the calyx *R. oxycanthoídes*
 - b. Flowers in elongated racemes, mostly numerous; stems densely prickly *R. lacústre*
2. Stems smooth, without spines or prickles; flowers in racemes Currants
 - a. Calyx flat or saucer-shaped
 - (1) Ovary and berries glandular bristly *R. prostrátum*
 - (2) Ovary and berries smooth
 - x. Calyx purplish; shrubs decumbent *R. triste*
 - y. Calyx greenish yellow; shrubs erect; cultivated *R. vulgáre*
 - b. Calyx campanulate to long-tubular
 - (1) Racemes erect or ascending, calyx white *R. hudsoniánum*
 - (2) Racemes drooping
 - x. Calyx greenish white *R. flóridum*
 - y. Calyx bright yellow *R. aúreum*

Philadélphus—Syringa, Mock Orange

(Gr. *philadelphos*, a sweet flowering shrub)

Pl. 11, fig. F : 1, 2

Shrub 2-3 m. high, with opposite leaves and large white flowers *P. grandiflórus*

Lythrales Loosestrife Order

Onagráceae—Evening Primrose Family

Herbs with opposite or alternate leaves, sepals (usually) 4, petals 4, stamens 4 or 8, ovary 4-celled; flower syncarpous, apopetalous, epigynous, regular or somewhat irregular.

Gaúra—Gaura

(Gr. *gauros*, proud)Plant gray-pubescent with scarlet somewhat irregular flowers *G. coccinea*

Aristolochiáceae—Birthwort Family

Herbs or shrubs with alternate or basal leaves, often aromatic; sepals 3 or 6, petals 0, stamens 6-many, ovary 6-celled; flower syncarpous, apetalous, epigynous, regular.

Ásarum—Wild Ginger

(Gr. *asaron*, name of a plant)Aromatic herb with two basal leaves, flower dull red *A. canadénse*

Celastrales Bittersweet Order

Rhamnáceae—Buckthorn Family

Shrubs or small trees, with alternate simple leaves; sepals 4-5, petals 4-5, rarely none, stamens 4-5, ovary 2-5-celled; flower syncarpous, apopetalous or apetalous, perigynous, regular.

Rhámnus—Buckthorn

(Gr. *rhamnos*, buckthorn)

1. Flowers usually dioecious; nutlets deeply grooved
 - a. Petals present, sepals and stamens 4; cultivated *R. cathártica*
 - b. Petals lacking, sepals and stamens 5; native *R. alnifólia*
2. Flowers perfect; nutlets smooth; cultivated *R. frángula*

Vitaceae—Grape Family

Woody vines with alternate leaves; sepals 4-5, often minute, petals 4-5, often disappearing as the flower opens, stamens 4-5, ovary 2-6-celled; flower syncarpous, apopetalous, hypogynous or perigynous, regular.

Vitis—Grape

(L. *vitis*, grapevine)

1. Lower leaf surface velvety; berries large; cultivated *V. labrusca*
2. Lower leaf surface smooth; berries small; native *V. vulpina*

Thymelaeaceae—Leatherwood Family

Shrubs with simple leaves; sepals 4-5, petals 0, stamens 8-10, pistil 1, simple; flower apetalous, perigynous, regular, the sepals more or less fused into a bell-shaped calyx.

Dirca—Leatherwood

Shrub with entire ovate leaves and minute bell-shaped flower *D. palustris*

Elaeagnaceae—Oleaster Family

Shrubs with silvery leaves; sepals 4, petals 0, stamens 4-8, pistil 1, simple; flower apetalous, apparently epigynous, regular, often dioecious.

- I. Stamens 4, flowers often perfect *Elaeagnus*
- II. Stamens 8, flowers dioecious *Shepherdia*

Elaeagnus—Silverberry

(Gr. *elaiagnos*, a marsh shrub)

Shrub with fragrant silvery flowers and silvery fruit *E. argentea*

Shepherdia—Buffalo Berry

(Named for John Shepherd, an English botanist)

Shrub with silvery leaves and scarlet fruit *S. argentea*

Santalaceae—Sandalwood Family

Herbs with alternate simple leaves; sepals 3-6, petals 0, stamens 3-6, ovary 1-celled; flower syncarpous, apetalous, partly epigynous, regular.

Comandra—Toadflax

(Gr. *coma*, tuft of hairs, *aner*, man, referring to the anthers)

Slender herb with clusters of small white flowers *C. umbellata*

Loranthaceae—Mistletoe Family

Parasitic green or almost colorless herbs or shrubs; sepals 2-6, petals 0, stamens 2-6, ovary 1-celled; flowers apetalous, epigynous, regular, monoecious or dioecious.

Razoumófskya—Small Mistletoe

(Named for a Russian botanist)

Minute, yellowish, leafless herb, parasitic on branches of spruce trees *R. pusilla*

Sapindales Maple Order

PLATE 12: A, *Acer saccharum*; B, *Acer negundo*, 1, staminate flowers, 2, pistillate flowers; C, *Betula papyrifera*, 1, staminate catkin, 2, pistillate catkin; D, *Corylus americana*, 1, staminate catkin, 2, pistillate cluster; E, *Juglans cinerea*, 1, staminate catkin, 2, pistillate cluster; F, *Quercus macrocarpa*, 1, staminate catkins, 2, pistillate flowers.

Staphyleaceae—Bladdernut Family

Trees or shrubs with opposite pinnate leaves; sepals 5, petals 5, stamens 5, ovary 2-3-celled, fruit bladdery; flower syncarpous, apopetalous, perigynous, regular.

SAPINDACEAE—ACERACEAE—JUGLANDACEAE

Staphyléa—Bladdernut

(Gr. *staphyle*, a bunch of grapes)

Leaves pinnately trifoliate; flowers white

S. trifolia

Sapindáceae—Soapberry Family

Trees or shrubs, with alternate, sometimes opposite, compound leaves; sepals 4-5, petals 3-5, stamens 5-10, rarely numerous, ovary 2-4-celled; flowers syncarpous, apopetalous, hypogynous, dioecious or polygamous, mostly irregular.

Aésculus—Horse Chestnut, Buckeye

(The Latin name)

1. Flowers white, yellow or purple-spotted; leaflets sharply acuminate *A. hippocástanum*
2. Flowers yellow; leaflets acuminate; bark fetid *A. glábra*

Aceráceae—Maple Family

Trees or large shrubs with opposite lobed or compound leaves; sepals 5, petals 5 or 0, stamens usually 5 or 8, ovary 2-celled, fruit a pair of winged pistils; flower syncarpous, apopetalous or apetalous, perigynous, dioecious or polygamous, usually regular.

Ácer—Maple

(L. *acer*, maple tree)

Pl. 12, fig. A; fig. B : 1, 2

1. Leaves simple
 - a. Shrubs; flowers in racemes or narrow panicles; native *A. spicátum*
 - b. Trees; flowers in panicles, corymbs, or umbel-like clusters; native and cultivated
 - (1) Leaves pinnately veined, irregularly serrate; flowers in terminal panicles *A. tatáricum*
 - (2) Leaves palmately lobed; lobes coarsely dentate-serrate or cut, or almost entire; flowers in corymbs or umbel-like clusters
 - (a) Flowers greenish, appearing with the leaves
 - x. Flowers in erect, flat-topped panicles; wings of fruit long, spreading *A. platanoides*
 - y. Flowers in pendant, umbel-like clusters, long-pedicelled; wings of fruit short, not spreading
 - (x) Leaves with shallow lobing; sinus at the base closed; petioles and veins beneath pubescent *A. nígrum*
 - (y) Leaves with deeper lobing; sinus at the base shallow or none; petioles glabrous *A. sacchárum*
 - (b) Flowers red or yellowish red, appearing from separate buds before the leaves
 - x. Flowers yellowish red; leaves deeply 5-lobed; lobes narrow at the base *A. saccharinum*
 - y. Flowers brilliant red; leaves about 3-lobed; lobes not narrow at the base *A. rúbrum*
2. Leaves compound; flowers strictly dioecious *A. negúndo*

Anacardiáceae—Sumac Family

Trees, shrubs, or woody vines, usually with compound alternate leaves; sepals 3-7, usually 5, petals 3-7 or 0, stamens 3-7, ovary 1-celled, styles 1-3; flower syncarpous, apopetalous, perigynous, regular.

Rhús—Poison Ivy

(Gr. *rhous*, sumac)

Low shrub or tall vine, with glossy trifoliate leaves; poisonous

R. rádicans

Juglandáceae—Walnut Family

Trees with alternate odd-pinnate leaves; flowers monoecious, the staminate in catkins; staminate flower with sepals 3-6 or 0, petals 0, stamens 3-many; pistillate flower, sepals 3-5, petals 4 or 0, ovary 1-celled, styles 2; flowers syncarpous, apopetalous or apetalous, epigynous, regular.

- I. Staminate catkins sessile, solitary or grouped; outer leaflets smaller than the middle ones *Juglans*
- II. Staminate catkins in groups of three with a common stalk; outer leaflets at least as large as the others *Carya*

Júglans—Butternut, Black Walnut

(L. *juglans*, walnut tree)

Pl. 12, fig. E : 1, 2

1. Bark gray; twigs and foliage viscid hairy *J. cinérea*
2. Bark dark brown; twigs and foliage almost smooth *J. nigra*

Cárya—Hickory

(Gr. *carya*, nut, walnut)

1. Bark shaggy; leaves white-tufted at margin *C. ováta*
2. Bark not shaggy; mature leaves almost smooth *C. cordifórmis*

Betuláceae—Birch Family

Trees or shrubs with alternate simple leaves; flowers monoecious, rarely dioecious, the staminate and often the pistillate also in catkins; staminate flower, sepals 2-4 or 0, petals 0, stamens 2-10; pistillate flower, sepals minute or 0, ovary 1-2-celled, style 2-cleft; flower syncarpous, epigynous, regular.

I. Pistillate flowers clustered, not in a raceme or catkin *Corylus*

II. Pistillate flowers in a raceme or catkin

1. Pistillate catkin small, terminal, few-flowered
 - a. Fruiting bract leaf-like, 3-lobed; bark smooth *Carpinus*
 - b. Fruiting bract closed, sac-like; bark rough *Ostrya*
2. Pistillate catkin compact, many-flowered
 - a. Pistillate bracts 3-lobed, 3-flowered *Betula*
 - b. Pistillate bracts 5-lobed, 2-flowered *Alnus*

Córylus—Hazel-nut

(Gr. *korys*, helmet)

Pl. 12, fig. D : 1, 2

1. Twigs and petioles densely hairy; involucre of nut short *C. americana*
2. Twigs and petioles smooth; involucre with a beak *C. rostráta*

Carpínus—Hornbeam

(Gr. *karpinos*, fruitful)

Small tree with smooth gray bark and very hard wood

C. caroliniana

Óstrya—Ironwood

(Gr. *ostrya*, tree with very hard wood)

Small tree with furrowed bark and very hard wood

O. virginiana

Bétula—Birch

(L. *betula*, birch-tree)

Pl. 12, fig. C : 1, 2

1. Trees with white bark
 - a. Leaves serrate or toothed, not deeply cut
 - (1) Bark peeling in papery layers; leaves ovate; native *B. papyrifera*
 - (2) Bark peeling slightly above, dark and furrowed at the base; leaves triangular *B. verrucósa*
 - b. Leaves deeply cut
 - (1) Leaves with long slender points *B. populifolia laciniáta*
 - (2) Leaves cut but not very long pointed *B. verrucósa lobáta*
2. Trees or shrubs with gray, yellow, or dark bark
 - a. Trees
 - (1) Twigs fragrant; bark very ragged, yellowish gray *B. lútea*
 - (2) Twigs not fragrant; bark reddish brown; trunk scaly *B. nigra*
 - b. Shrubs
 - (1) Tall shrubs, 4-8 m. high; leaves ovate *B. Sandbergii*
 - (2) Shrub 1-2 m. high; leaves ovate to orbicular *B. púmila*

Álnus—Alder

(L. *alnus*, alder)

1. Leaves finely serrate, resinous beneath when young *A. alnobétula*
2. Leaves coarsely serrate, not resinous *A. incána*

Fagaceae—Beech Family

Trees or shrubs with simple often deeply lobed or cleft leaves; flowers monoecious, the staminate in catkins; staminate flower, sepals 4-7, petals 0, stamens 4-20; pistillate flower, sepals disappearing, petals 0, ovary 3-celled; flower syncarpous, epigynous, regular.

Quercus—Oak

(L. *quercus*, oak tree)

Pl. 12, fig. F : 1, 2

1. Leaves lobed; lobes acute, bristle-pointed (Black Oaks)
 - a. Leaves dull green; lobes cut about half way to the midrib; acorn cup shallow *Q. rubra*
 - b. Leaves glossy; the lobes cut about three-fourths to the midrib; acorn cup about one-half as long as acorn
 - (1) Scales of cup loose, pubescent *Q. velutina*
 - (2) Scales of cup appressed, smooth
 - (a) Acorn elongated; autumn foliage brown *Q. ellipsoidalis*
 - (b) Acorn nearly round; autumn foliage scarlet *Q. coccinea*
2. Leaves with rounded lobes or crenate or toothed; lobes not bristle-tipped (White Oaks)
 - a. Leaves deeply round lobed
 - (1) Leaves dull, smooth; acorn cup not fringed *Q. alba*
 - (2) Leaves glossy above, hairy below; acorn cup fringed *Q. macrocarpa*
 - b. Leaves crenate or dentate, not deeply lobed
 - (1) Tree; leaves broadly rhombic; acorn long-peduncled *Q. bicolor*
 - (2) Shrub or small tree; leaves more than twice as long as broad; acorn short-peduncled *Q. prinoides*

Myricaceae—Bayberry Family

Shrubs or trees with alternate aromatic simple leaves; flowers in catkins, monoecious or dioecious; staminate flower, sepals 0, petals 0, stamens 2-16; pistillate flower, with 2-8 bracts, sepals 0, petals 0, ovary 1-celled, stigmas 2; flower syncarpous, naked.

I. Leaves entire or slightly serrate *Myrica*

II. Leaves deeply cut *Comptonia*

Myrica—Sweet Gale

(Gr. *myrike*, tamarisk)

Fragrant swamp shrub, resembling a small willow

M. gale

Comptonia—Comptonia

(Named for Bishop Compton)

Fragrant shrub with thick, linear, deeply cut leaves

C. peregrina

Apiales Carrot Order

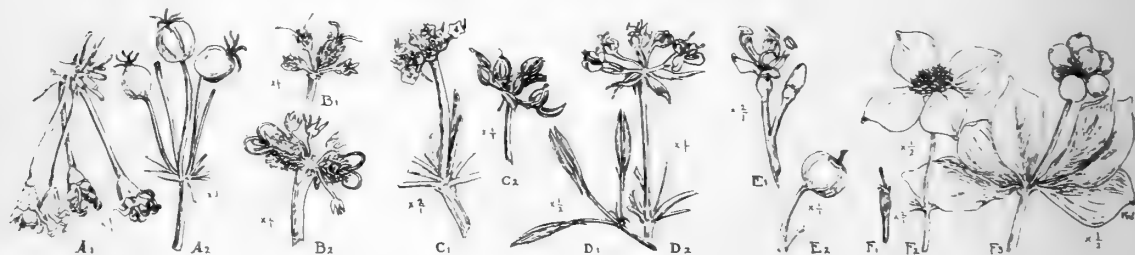


PLATE 13: A, *Aralia nudicaulis*, 1, flowers, 2, fruits; B, *Sanicula marylandica*, 1, young flowers, 2, nearly mature fruits; C, *Zizia aurea*, 1, flowers, 2, fruits; D, *Osmorhiza claytoni*, 1, fruits, 2, flowers; E, *Cornus stolonifera*, 1, flowers, 2, fruit; F, *Cornus canadensis*, 1, single flower, 2, flower cluster, 3, fruit cluster.

Araliaceae—Ginseng Family

Herbs with compound leaves; sepals 5, often tiny, petals 5, stamens 5, ovary 2-5-celled; flower syncarpous, apopetalous, epigynous, regular.

1. Leaves in whorls; styles 2-3

Panax

2. Leaves alternate; styles 5

Aralia

Pánax—Ginseng

(Gr. **panax**, a heal-all plant, a panacea)

Leaves in whorls of 3, digitate; root globose, small

P. trifolium

Arália—Wild Sarsaparilla

(Name unexplained)

Pl. 13, fig. A : 1, 2

Leaf usually solitary, pinnate; flowers greenish

A. nudicaulis

Apiáceae—Carrot Family

Herbs with alternate and usually compound leaves; sepals 5, often very tiny, petals 5, stamens 5, ovary 2-celled, styles 2; flower syncarpous, apopetalous, epigynous, regular.

I. Ovary bristly; flowers monoecious

Sanicula

II. Ovary not bristly; flowers perfect

1. Flower white or pinkish

a. Lobes of leaflets linear; fruit round, flattened

Lomatium

b. Lobes of leaflets broad; fruit long, pointed

Osmorhiza

2. Flower yellow

a. Fruit flattened, winged

Thaspium

b. Fruit neither flattened nor winged

Zizia

Sanícula—Snakeroot

(L. **sano**, to heal)

Pl. 13, fig. B : 1, 2

1. Flowers greenish white, sepals lanceolate, acute

S. marylandica

2. Flowers yellow, sepals short, obtuse

S. gregária

Lomátium—Wild Parsley

(Gr. **lomation**, fringe)

Low herb with much dissected leaves

P. nudicaule

Osmorhiza—Sweet Cicely

(Gr. **osme**, odor, **rhiza**, root)

Pl. 13, fig. D : 1, 2

1. Hairy; style and stylopodium short

O. cláytoni

2. Nearly smooth; style and stylopodium long

O. longistylis

Tháspium—Meadow Parsnip

(Gr. **thapsia**, a plant with a yellow dye)

Tall herb with biternate, cut leaves

T. barbinóde

Zizia—Zizia

(Named for the botanist Ziz)

Pl. 13, fig. C : 1, 2

1. Basal leaves simple, cordate

Z. cordáta

2. Basal leaves compound, 2-3 times ternate

Z. aúrca

Cornáceae—Dogwood Family

Shrubs and trees, rarely herbs, usually with opposite leaves; sepals 4, rarely 5, petals 4, stamens 4, pistil 1-2-celled, style 1; flower syncarpous, apopetalous, epigynous, regular.

Córnuş—Dogwood

(L. **cornus**, cornel)

Pl. 13, fig. E : 1, 2; fig. F : 1, 2, 3

1. Dwarf herb; flowers tiny, in a head with 4-6 white bracts

C. canadensis

2. Shrubs; flowers without bracts

a. Leaves opposite

(1) Twigs green; leaves broadly ovate or orbicular

C. circináta

(2) Twigs red or yellowish; leaves much longer than broad

(a) Leaves woolly, pubescent beneath

C. baileyi

(b) Leaves smooth beneath

C. stolonífera

b. Leaves alternate

C. alternifólia

Rubiales Madder Order

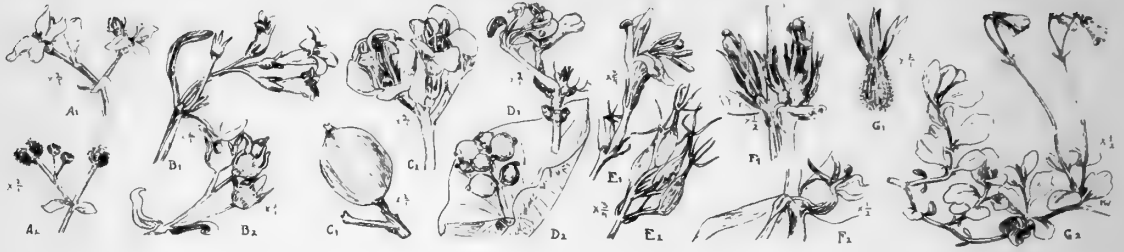


PLATE 14: A, *Galium boreale*, 1, flowers, 2, fruits; B, *Houstonia angustifolia*, 1, flowers, 2, fruits; C, *Viburnum pubescens*; D, *Lonicera dioica*, 1, flowers, 2, fruits; E, *Diervilla lonicera*, 1, flower, 2, fruits; F, *Triosteum aurantiacum*, 1, flowers, 2, fruit; G, *Linnaea borealis*, 1, fruit, 2, plant with flowers.

Rubiaceae—Madder Family

Herbs with simple opposite or whorled leaves; sepals usually 4, often disappearing; petals 4, stamens 4, ovary 1-several-celled, styles 1 or 2; flower syncarpous, sympetalous, epigynous, regular.

1. Leaves in opposite pairs; flowers funnellform

- a. Creeping herbs; flowers in pairs; the ovaries united
- b. Erect plants; flowers in many-flowered cymes, ovaries not united

Mitchella
Houstonia
Galium

2. Leaves in whorls of 4 or more; flowers nearly flat

Mitchella—Partridge Berry

(Named for the botanist Mitchell)

Leaves round, opposite; flowers white

M. repens

Houstonia

(Named for Dr. Wm. Houston, an English botanist)

Pl. 14, fig. B : 1, 2

Stems tufted; flowers blue, corolla bearded inside

H. angustifolia

Galium—Bedstraw

(Gr. *galion*, bedstraw)

Pl. 14, fig. A : 1, 2

1. Ovary and fruit bristly

- a. Stem weak, with coarse bristles; flowers greenish
- b. Stem upright, not bristly; flowers white

G. aparine
G. boreale
G. tinctorium

2. Ovary and fruit smooth

Caprifoliaceae—Honeysuckle Family

Herbs, shrubs or vines with opposite leaves; sepals 3-5, often very tiny, petals 5, stamens 5, ovary 1-6-celled, style 1, often cleft; flower syncarpous, sympetalous, epigynous, regular or irregular.

I. Erect or climbing shrubs

1. Leaves pinnately compound
2. Leaves simple
 - a. Corolla regular, rotate; erect shrubs
 - b. Corolla bell- or funnel-shaped; somewhat 2-lipped
 - (1) Leaves entire; sepals vestigial
 - (2) Leaves serrate; sepals present, lanceolate

Sambucus

Viburnum

Lonicera

Diervilla

II. Herbs, or nearly herbaceous

1. Creeping, slightly woody; flowers in pairs on long stalks
2. Low erect herb, with sessile axillary flowers

Linnaea

Triosteum

Sambucus—Elder

(L. *sambucus*, elder tree)

Shrub with yellowish white flowers and red berries

S. pubens

CAPRIFOLIACEAE—ADOXACEAE

Viburnum—Viburnum, Cranberry-tree

(L. *viburnum*, the wayfaring-tree)

Pl. 14, fig. C : 1, 2

1. Leaves palmately veined, 3-lobed
 - a. Flowers all perfect and alike; leaves not deeply lobed *V. pauciflorum*
 - b. Some or all of the flowers sterile; leaves more deeply 3-lobed and coarsely dentate
 - (1) Outer flowers large and sterile, inner ones smaller and perfect *V. americanum*
 - (2) All of the flowers sterile, in nearly spherical clusters *V. opulus sterilis*
2. Leaves not lobed, pinnately veined, dentate or serrate
 - a. Leaves finely serrate, not prominently veined
 - (1) Leaves and inflorescence densely pubescent; cultivated *V. lantana*
 - (2) Leaves and inflorescence glabrous; native *V. lentago*
 - b. Leaves coarsely dentate, veins prominent *V. pubescens*

Lonicera—Honeysuckle

(Named for the botanist Loniczer)

Pl. 14, fig. D : 1, 2

1. Flowers terminal, in dense clusters or interrupted spikes; upper leaves connate-perfoliate; usually vines
 - a. Margin of leaves parchment-like, not ciliate
 - (1) Leaves nearly or quite glabrous *L. dioica*
 - (2) Leaves pubescent beneath *L. dioica glaucescens*
 - b. Margin of leaves green, ciliate *L. hirsuta*
2. Flowers in pairs, on axillary peduncles; leaves not connate-perfoliate; mostly upright shrubs
 - a. Peduncles long and slender, over 1 cm. long
 - (1) Leaves pubescent; native shrubs
 - (a) Leaves thick, woolly; corolla 2-lipped *L. oblongifolia*
 - (b) Leaves thin, bristly; corolla nearly regular *L. canadensis*
 - (2) Leaves glabrous; corolla not 2-lipped; cultivated *L. tatárca*
 - b. Peduncles mostly under 1 cm. long; leaves thick and veiny
 - (1) Ovaries united; berry blue-black; native *L. coerulea*
 - (2) Ovaries separate; berries red; cultivated *L. Morrówii*

Diervilla—Bush Honeysuckle

(Named for Dierville)

Pl. 14, fig. E : 1, 2

1. Native; flowers less than 2 cm. long, yellow *D. lonicera*
2. Cultivated; flowers more than 2 cm. long, rose-pink or white *D. florida*

Linnaea—Twinsflower

(Named for the great Swedish botanist Linné)

Pl. 14, fig. G : 1, 2

- Creeping vine with opposite evergreen leaves, and pink flowers *L. borealis*

Triosteum—Horse Gentian

(Gr. *tri-*, three, *osteon*, bone)

Pl. 14, fig. F : 1, 2

- Leaves ovate, sessile; flowers purple-brown *T. aurantiacum*

Adoxaceae—Muskroot Family

Herbs with basal and opposite compound leaves; sepals 2-3, petals 4-6, stamens 8-12 in pairs, ovary 3-5-celled, styles 3-5-cleft; flower syncarpous, sympetalous, half epigynous, regular.

Adoxa—Muskroot

(Gr. *adoxos*, obscure)

Pl. 15, fig. A : 1, 2

- Leaves twice ternate; flowers small, greenish *A. moschatellina*

Campanales Bluebell Order

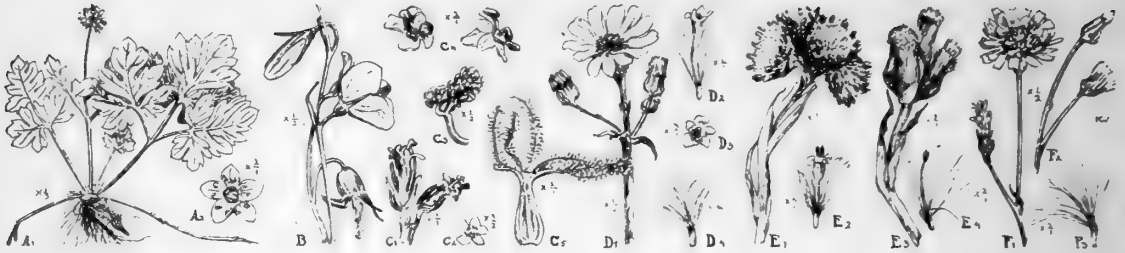


PLATE 15: A, *Adoxa moschatellina*, 1, plant, 2, flower; B, *Campanula rotundifolia*; C, *Valeriana edulis*, 1, pistillate flowers, 2, single pistillate flower, 3, cluster of staminate flowers, 4, staminate flowers enlarged, 5, fruit; D, *Senecio*, 1, heads, 2 and 3, single flower, 4, fruit; E, *Antennaria campestris*, 1, staminate plant, 2, staminate flower, 3, pistillate plant, 4, single pistillate flower; F, *Crepis runcinata*, 1, flowering heads, 2, fruiting heads, 3, fruit.

Campanulaceae—Bluebell Family

Herbs with alternate leaves and milky juice; sepals 5, petals 5, stamens 5, united by their anthers, ovary 1-5-celled, ovules numerous, style 1; flower syncarpous, sympetalous, regular or irregular.

Campánula—Bluebell, Harebell

(Latin diminutive of *campana*, a bell)

Pl. 15, fig. B

Basal leaves round, stem leaves linear; flowers blue, bell-shaped

C. rotundifolia

Asterales Aster Order

Valerianaceae—Valerian Family

Herbs with opposite leaves; sepals vestigial in the flower, but developing into plummy hairs on the fruit, petals 5, stamens 1-4, ovary 1-3-celled, stigmas 1-3; flower syncarpous, sympetalous, epigynous, somewhat irregular.

Valeriana—Valerian

(*L. valeo*, to be strong)

Pl. 15, fig. C : 1, 2, 3, 4, 5

1. Leaves thick, parallel-veined; leaflets entire; native
2. Leaves thin, reticulate-veined; leaflets dentate; cultivated

V. edulis

V. officinalis

Asteraceae—Aster Family

Herbs (shrubs or trees) with watery juice and flowers often of two kinds in dense involucrate heads; sepals (pappus) in form of bristles, scales, teeth, etc., or wanting, petals 5, stamens 5 or 0, united by their anthers; ovary 1-celled, 1-ovuled, style 1, 2-cleft, stigmas 2; flower syncarpous, sympetalous, regular or irregular, epigynous. All the flowers of the head or more commonly only the central ones are bell-shaped or salver-shaped and regular (disk flowers). The marginal flowers of the head are often ligulate. The receptacle is flat or more or less conical, naked (i. e., bearing only the flowers) or bearing scales among the flowers. The head is surrounded by 1 or more rows of involucre bracts.

I. Leaves finely dissected

Achillea

II. Leaves entire to coarsely cut

Senecio

1. Flowers yellow

2. Flowers purple to white

Antennaria

a. Heads staminate and pistillate, on different plants

b. Heads perfect

Petasites

(1) Ray flowers lacking or very small; basal leaves very large

(2) Ray flowers conspicuous, ribbon-like

Erigeron

Achilléa—Yarrow

Heads very small

A. millefolium

Senécio—Groundsel, Ragwort

Pl. 15, fig. D : 1, 2, 3, 4

1. Heads 10-14 mm. high; plants 3-15 dm. tall; bracts acute, or obtuse, mostly black-tipped; leaves denticulate *S. ligens*
2. Heads 6-10 mm. high; plants 1.5-3 dm. tall
 - a. Basal leaves oblong, 2.5-7.5 cm. long; stem woolly below, achene hispid *S. balsamitae*
 - b. Basal leaves cordate or subcordate; plants mostly glabrous *S. aureus*
 - c. Stem leaves sinuate-dentate; swamp plants *S. palustris*

Antennária—Ladies' Tobacco

Pl. 15, fig. E : 1, 2, 3, 4

- Basal leaves distinctly 1-nerved *A. campestris*

Petasites—Colts-foot

1. Leaves round, deeply lobed *P. palmata*
2. Leaves arrow-shaped, margin sinuate *P. sagittata*

Erigeron—Daisy

1. Stems simple; heads 2.5-4 cm. broad *E. pulchellus*
2. Stem branched; heads 1-2.5 cm. broad *E. philadelphicus*

Cichoriaceae—Chicory Family

Herbs with milky juice and flowers all alike in dense involucrate heads; sepals (pappus) in form of scales or bristles or wanting, petals 5, fused into a ligulate corolla, stamens 5, united by their anthers; ovary 1-celled, 1-ovuled, stigmas 2; flower syncarpous, sympetalous, irregular, epigynous. The corolla has a short tube, beyond which it extends as a flat, strap-shaped ray.

- I. Leaves entire, long-pointed *Nothocalais*
- II. Leaves serrate, or deeply cut
 1. Achene long-beaked *Taraxacum*
 2. Achene beakless
 - a. Flower bright yellow *Crepis*
 - b. Flowers orange *Adopogon*

Nothocalais

- Heads yellow, solitary; leaves narrow *N. cuspidata*

Taraxacum—Dandelion

- Leaves irregularly coarsely dentate *T. taraxacum*

Crépis

Pl. 15, fig. F : 1, 2, 3

- Stem nearly leafless, branched; heads several, yellow *C. runcinata*

Adopogon

- Stem 1-leaved, branched above; heads 2-6 *A. virginicum*

MONOCOTYLEDONS

Arales Arum Order

Araceae—Arum Family

Herbs with flowers in a spike which is subtended or surrounded by a spathe; sepals 4-6 or 0, petals 0, stamens 4-7, ovary 1-celled; flowers syncarpous, apetalous, ovary sunk in the fleshy axis.

- I. Sepals present
 1. Spadix with a leaf-like spathe, i. e., naked; leaves grass-like *Acorus*
 2. Spadix covered by a hood-like spathe; leaves broad *Symplocarpus*
- II. Sepals absent
 1. Flowers perfect; leaves simple *Calla*
 2. Flowers staminate and pistillate; leaves compound *Arisaema*



PLATE 16: A, *Acorus calamus*; B, *Symplocarpus foetidus*, 1, spathe, 2, spadix, 3, flower; C, *Calla palustris*; D, *Arisaema dracontium*; E, *Arisaema triphyllum*, 1, spathe, 2, spadix, 3, pistillate flower, 4, staminate flower.

Acorus—Sweet Flag

(Gr. *akoros*, sweet flag)

Pl. 16, fig. A.

Leaves sword-shaped; spadix apparently lateral on a triangular scape

A. calamus

Symplocarpus—Skunk Cabbage

(Gr. *symploke*, connection, *karpus*, fruit)
(*Spathyema*)

Pl. 16, fig. B : 1, 2, 3

Leaves broad, simple, ill-smelling when crushed

S. foetidus

Calla—Water Arum

(L. *calla*, name of a plant)

Pl. 16, fig. C

Leaves heart-shaped; spathe open, white

C. palustris

Arisaema—Jack-in-the-pulpit, Dragon Root

(Gr. *arison*, arum, *haema*, blood)

Pl. 16, fig. D; E : 1, 2, 3, 4

1. Leaves with 3 leaflets; spadix covered by spathe

A. triphyllum

2. Leaves with 5-17 leaflets; spadix exerted beyond the spathe

A. dracontium

Liliales Lily Order

Commelinaceae—Spiderwort Family

Grass-like herbs with fleshy leaves and mucilaginous sap; sepals 3, petals 3, stamens 6, ovary 3-celled; flower syncarpous, apopetalous, hypogynous, regular.

Sepals green, petals colored

Tradescantia

Tradescantia—Spiderwort

(Named for Tradescant)

1. Sepals and pedicels smooth

T. reflexa

2. Sepals glandular pubescent

a. Leaves and bracts 5-10 mm. wide

T. occidentalis

b. Leaves and bracts 1-2 cm. wide

T. bracteata

Liliaceae—Lily Family

(Including the Melanthaceae and Convallariaceae)

Herbaceous plants, with scapes or leafy stems growing from bulbs, corms or rootstocks; sepals 3, petals 3, stamens 6, ovary 3-celled; flowers syncarpous, apopetalous or sometimes sympetalous, hypogynous, regular.

I. Sepals green, petals colored; leaves in a whorl of 3, broad

Trillium

II. Sepals colored like the petals

1. Native plants

a. Flowers in a cluster at the top of a leafless stem, i. e., a scape

(1) Plant bulbous, with a strong onion-like odor

Allium

(2) Plant with a rootstock, nearly odorless

Clintonia

- b. Flowers borne on a leafy stem
- (1) Flowers or flower clusters borne at the nodes
 - (a) Flowers mostly in clusters of 2-6, borne in the axils of the leaves *Polygonatum*
Streptopus
 - (b) Flowers mostly solitary, borne beside the leaves
 - (2) Flowers or flower clusters terminal
 - (a) Flowers single or few
 - x. Stem unbranched, leaves 2 *Erythronium*
Uvularia
 - y. Stem branched, leaves numerous
 - (b) Flowers numerous in a raceme or panicle
 - x. Petals with a gland at the base; plant bulbous *Zygadenus*
 - y. Petals without glands; stem arising from a rootstock
 - (x) Sepals 3, petals 3 *Smilacina*
 - (y) Sepals 2, petals 2 *Maianthemum*
2. Cultivated plants
- a. Flowers on leafless stems; leaves all basal
 - (1) Sepals and petals free, some of the flowers often solitary, others in racemes *Scilla*
 - (2) Sepals and petals united at the base, flowers clustered
 - (a) Flowers small (less than 2.5 cm. long), lasting for several days
 - x. Flowers wheel-shaped, free part of sepals and petals longer than the united bases *Chionodoxa*
 - y. Free part of sepals and petals shorter than the united bases
 - (x) Flowers globular *Muscari*
 - (y) Flowers bell-shaped
 - m. Leaves linear; plant bulbous *Hyacinthus*
 - n. Leaves ovate-lanceolate; plant with a rootstock *Convallaria*
 - (b) Flowers large (6-10 cm. long), trumpet-shaped, lasting but one day *Hemerocallis*
 - b. Flowers large (over 2.5 cm. long), borne at the top of leaf-bearing stems
 - (1) Flower erect, solitary; stem leaves few *Tulipa*
 - (2) Flower nodding, solitary or clustered; stem leaves several-many *Fritillaria*

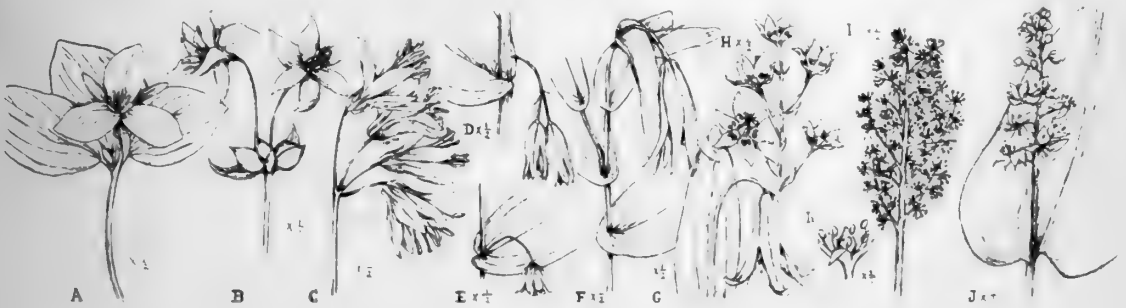


PLATE 17: A, *Trillium nivale*; B, *Allium canadense*; C, *Clintonia borealis*; D, *Polygonatum biflorum*; E, *Streptopus longipes*; F, *Uvularia grandiflora*; G, *Erythronium albidum*; H, *Zygadenus elegans*; I, *Smilacina racemosa*, 1, inflorescence, 2, flower; J, *Maianthemum canadense*.

Trillium—Wake-robin

(Of uncertain origin, but probably from Gr. *tri-*, three)

Pl. 17, fig. A

1. Leaves oval or ovate, obtuse, 2.5-5 cm. long; flowers in April *T. nivale*
2. Leaves broadly ovate or rhombic, acuminate, 5-17 cm. long; flowers mostly in May
 - a. Petals very large, 3.5-6 cm. long, more or less erect *T. grandiflorum*

LILIACEAE

b. Petals 1.5-3.5 cm. long, spreading or strongly recurved

(1) Peduncles of the flower 3-10 cm. long, erect or declined, petals spreading

T. declinátum

(2) Peduncles of the flowers 3 cm. long or less, recurved beneath the leaves, petals recurved

T. cernuum

Allium—Onion

(L. **allium**, garlic)

Pl. 17, fig. B

1. Leaves ovate-lanceolate, in earliest spring, withering before the flowers appear

A. tricoccum

2. Leaves linear, present during flowering

a. Flowers mostly replaced by bulblets; fruit not crested

A. canadense

b. Flowers rarely replaced by bulblets; fruit crested

A. reticulátum

Clintonia

(Named for DeWitt Clinton)

Pl. 17, fig. C

Herb with broad basal leaves, and an umbel of drooping flowers

C. boreális

Polygonátum—Solomon's Seal

(Gr. **polygonaton**, knot-grass)

Pl. 17, fig. D

1. Leaves pubescent beneath; filaments slender, rough

P. biflorum

2. Leaves glabrous; filaments smooth and flattened

P. commutátum

Stréptopus—Twisted-stalk

(Gr. **streptos**, twisted, **pous**, foot)

Pl. 17, fig. E

1. Leaves smooth, strongly clasping; pedicels of flowers abruptly bent in the middle

S. amplexifolius

2. Leaves hispid along the margin, slightly clasping; pedicels of flowers slightly bent

S. longipes

Erythrónium—Adder's-tongue (Dog's-tooth Violet)

(Gr. **erythronion**, a plant with red)

Pl. 17, fig. G

1. Stem with a fleshy offshoot below the leaves; flowers rose-colored

E. propállans

2. Stem without a fleshy offshoot

a. Flowers yellow, stigmas very short

E. americanum

b. Flowers white or tinted with purple, stigmas recurved

E. álbidum

Uvulária—Bellwort

(L. **uva**, the soft palate)

Pl. 17, fig. F

1. Leaves perfoliate; flowers lemon yellow

U. perfoliáta

a. Leaves glabrous, glaucous; sepals and petals rough within

U. grandiflóra

b. Leaves pubescent beneath; sepals and petals smooth within

U. sessilifólia

2. Leaves sessile; flowers greenish yellow

Zygadénus—Zygadenus

(Gr. **zygon**, yoke, **aden**, gland)

Pl. 17, fig. H

Gland of the petal obcordate, petals 8-10 mm. long

Z. elegans

Smilacína—False Solomon's Seal

(Diminutive of Smilax)

(Vagnera)

Pl. 17, fig. I : 1, 2

1. Leaves numerous

a. Flowers numerous, panicked

S. racemósa

b. Flowers few-several, racemose

S. stelláta

2. Leaves 2-4; flowers few-several

S. trifoliáta

Maianthemum—False Lily-of-the-valley

(L. *Maïus*, May, Gr. *anthemon*, a flower)

(Unifolium)

Pl. 17, fig. J

Leaves 1-3, usually 2, cordate; flowers small, white

M. canadense

PLATE 18: A, *Scilla sibirica*; B, *Chionodoxa Luciliae*; C, *Muscari botryoides*, 1. flower, 2. inflorescence; D, *Hyacinthus orientalis*, 1. inflorescence, 2. flower; E, *Convallaria majalis*; F, *Hemerocallis flava*; G, *Tulipa gesneriana*; H, *Fritillaria meleagris*.

Scilla—Squill

(L. *scilla*, squill)

Pl. 18, fig. A

1. Flower bell-shaped, raceme long stalked

- a. Pedicels about 1 cm. long

- b. Pedicels about 3 cm. long

2. Flowers nearly flat, raceme few-flowered, and with solitary basal flowers

*S. festalis**S. hispánica**S. sibirica*

Chionodoxa—Glory-of-the-snow

(Gr. *chion*, snow, *doxa*, glory)

Pl. 18, fig. B

Flowers in loose racemes, blue with a white edge

C. Luciliae

Muscari—Grape Hyacinth

(Named for the musky odor of some species)

Pl. 18, fig. C : 1, 2

Bulbous plant with small blue globular flowers

M. botryoides

Hyacinthus—Hyacinth

(Gr. *hyakinthos*, a youth from whose blood sprang this flower)

Pl. 18, fig. D : 1, 2

Bulbous plant with a dense raceme of fragrant bell-shaped flowers

H. orientalis

Convallaria—Lily-of-the-valley

(L. *convallis*, a closed valley)

Pl. 18, fig. E

Plant with lance-ovate leaves, and a loose raceme of white fragrant bell-shaped flowers

C. majalis

Hemerocallis—Yellow Day Lily, Lemon Lily

(Gr. *hemera*, day, *kallis*, beauty)

Pl. 18, fig. F

1. Flower orange, margin of petals membranous and wavy

H. Dumontii

2. Flower yellow, margin of petals smooth

H. flava

Tulipa—Tulip

(Name probably Turkish)

Pl. 18, fig. G

Most of the garden tulips are considered to be forms of the following species:

1. Pubescent; flowering in April and May

T. suaveolens

2. Smooth; flowering in late May

T. gesneriana

SMILACACEAE—JUNCACEAE

Fritillária—Fritillary, Crown Imperial

(L. *fritillus*, a dice-box)

Pl. 18, fig. H

1. Flowers solitary, petals and sepals marked like a checker-board
2. Flowers clustered, bad smelling, petals and sepals red or orange

*F. meleágris**F. imperiális*

Smilacáceae—Smilax Family

Plants with woody or herbaceous stems, most'y vines, often prickly; leaves broad, net-veined; sepals 3, petals 3, stamens 6, ovary 3-celled; flowers syncarpous, apopetalous, hypogynous, regular, dioecious.

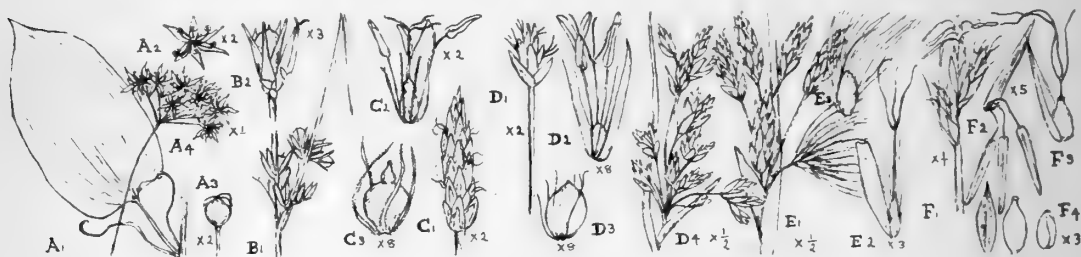


PLATE 19: A, *Smilax herbacea*, 1, leaf, 2, staminate flower, 3, pistillate flower, 4, inflorescence; B, *Juncus tenuis*, 1, inflorescence, 2, flower; C, *Heleocharis palustris*, 1, spike, 2, flower, 3, fruit; D, *Scirpus*, 1, *S. pauciflorus*, spike, 2, flower, 3, fruit, 4, *validus*, inflorescence; E, *Eriophorum angustifolium*, 1, inflorescence, 2, flower, 3, fruit; F, *Carex pennsylvanica*, 1, inflorescence, 2, staminate flower, 3, pistillate flower, 4, fruiting scale, perigynium, and achene.

Smilax—Greenbrier

(Gr. *smilax*, bindweed)

Pl. 19, fig. A : 1, 2, 3, 4

1. Stem annual, herbaceous, without prickles
 - a. Stems climbing; petioles with tendrils
 - b. Stems erect growing; tendrils lacking or sometimes slightly developed
2. Stems perennial, woody, generally with prickles
 - a. Leaves rounded or lanceolate, with 5 veins, prickles not very numerous
 - b. Leaves with 7 veins, prickles very numerous

*S. herbácea**S. ecirrháta**S. rotundifólia**S. hispida*

Juncales Rush Order

Juncáceae—Rush Family

Grass-like, more or less tufted herbs with small brownish green or brown flowers; sepals 3, petals 3, stamens 6, ovary 3-celled; flowers syncarpous, apopetalous, hypogynous, regular.

I. Leaves grass-like, sheaths closed; capsule 3-seeded

Luzula

II. Leaves rounded, sheaths open; capsule many-seeded

Juncus

Lúzula—Wood-rush

(From Ital. *luciola*, glow-worm)

(Juncoides)

1. Inflorescence umbellate, 1 or 2 flowers on each of its branches
2. Inflorescence of 2-12 spike-like or capitate clusters

*L. saltuénsis**L. campéstre*

Júncus—Rush

(L. *juncus*, rush)

Pl. 19, fig. B : 1, 2

1. Leaves without blades, scale-like sheaths at the base of the stem, inflorescence appearing lateral
2. Leaves with blades, inflorescence appearing terminal, subtended by a narrow leaf

*J. effúsus**J. ténuis*

Poales Grass Order

Cyperáceae—Sedge Family

Grass- or rush-like herbs, leaves with closed sheaths and narrow blades or blades sometimes lacking; stems solid, often triangular; flowers in spikelets, either solitary or clustered; sepals 0, petals 0, stamens 1-3, ovary 1-celled, flowers in the axil of a scale, naked or with hairs, bristles or a perigynium, hypogynous.

I. Flowers perfect, pistil surrounded by bristles or hairs

1. Base of the style swollen, persistent

Heleocharis

2. Base of the style not swollen, deciduous

a. Pistil surrounded by 1-6 bristles

Scirpus

b. Pistil surrounded by 6-many smooth hairs

Eriophorum

II. Flowers staminate and pistillate, pistillate one surrounded by a perigynium

Carex

Heleocharis—Spike Rush

(Gr. **heleos**, marsh, **charis**, grace)

Pl. 19, fig. C : 1, 2, 3

Style 2-cleft; creeping rootstock; perennial

H. palustris

Scirpus—Clubrush, Bulrush

(L. **scirpus**, rush)

Pl. 19, fig. D : 1, 2, 3, 4

1. Spikelet solitary and terminal; involucre leaf or bract lacking

S. pauciflorus

2. Spikelets more than one, appearing terminal or lateral; involucre leaf 1

a. Culm sharply 3-angled; spikelets 2-several; involucre leaf long

S. americanus

b. Culm round, tall; spikelets many; involucre leaf short, appearing like the tip of the stem

S. validus

3. Spikelets several; involucre leaves 2; stem stout, triangular

S. fluviatilis

Eriophorum—Cotton-grass

(Gr. **erion**, wool, **phora**, bearing)

Pl. 19, fig. E : 1, 2, 3

1. Spikelets solitary

E. callitrix

2. Spikelets in a cluster

a. Spikelets in an umbel, hairs white

(1) Flowering stems less than 1 mm. thick at the top; basal leaves wanting

E. gracile

(2) Flowering stems 1-2 mm. thick at the top; basal leaves present, flat

(a) Leaf-sheaths green, scales of inflorescence with a strong midrib to the tip

E. viridi-carinatum

(b) Leaf-sheaths with a dark top, scales of inflorescence with a papery, nerveless tip

E. angustifolium

b. Spikelets in a head, hairs brown

E. virginicum

Carex—Sedge

(L. **carex**, sedge)

Pl. 19, fig. F : 1, 2, 3, 4

A large genus, several species of which begin to blossom before June 1. Since the ripe fruit is necessary for a correct determination of the species a key to the species is not given. *Carex pennsylvanica* has mature achenes before the end of May.

Poaceae—Grass Family

Perennial herbs with narrow sheathing leaves; stems round with nodes and internodes; flowers in spikelets; sepals 0, petals 0, stamens 2 or 3, flower naked, between two scales, hypogynous.

I. Spikelet with but 1 perfect flower

1. Axis of spikelet jointed below the empty scales, scales firm and shiny *Panicum*

2. Axis of spikelet jointed above the empty scales
- a. Flowering scale with more or less elongated awn
 - (1) Awn short, less than 12 mm. long, not twisted
 - (a) Awn about 10 mm. long, spikelets stalked, in a panicle *Oryzopsis*
 - (b) Awn 1-5 mm. long, spikelets in a dense spike *Alopecurus*
 - (2) Awn long, twisted, bent at the middle *Stipa*
 - b. Flowering scale awnless
 - (1) Spikelets in dense narrow panicles, 1-flowered *Phalaris*
 - (2) Spikelets in loose panicles
 - (a) Spikelets 3-flowered, the two lower staminate; plants fragrant *Hierochloe*
 - (b) Spikelets 1-flowered *Milium*
- II. Spikelets with 2-many perfect flowers
1. Flowering scale 1-3-nerved
 - a. Spikelets 2-flowered, second empty scale broader than the flowering scale *Sphenopholis*
 - b. Spikelet 2-7-flowered, second empty scale not broader than the flowering scale *Koeleria*
 2. Flowering scale 5-many-nerved
 - a. Flowering scale more or less strongly compressed and keeled, mostly webby at the base *Poa*
 - b. Flowering scale rounded on the back, at least below, not webby
 - (1) Spikelets solitary at each node
 - (a) Stigmas at the apex of the ovary *Festuca*
 - (b) Stigmas below the apex of the ovary *Bromus*
 - (2) Spikelets in pairs at the nodes *Asprella*

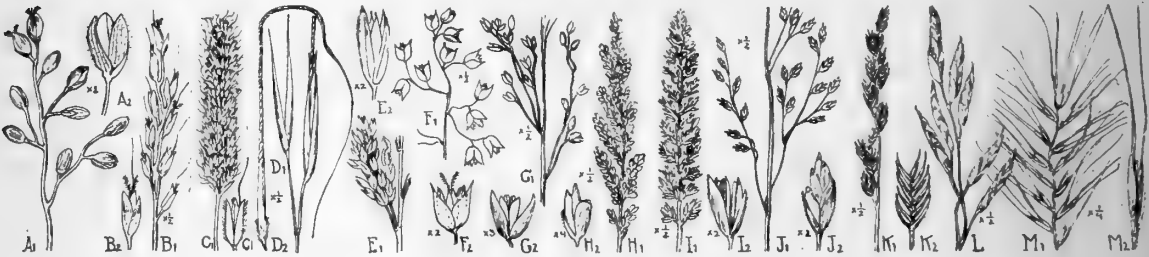


PLATE 20: A, *Panicum*, 1, part of panicle, 2, spikelet; B, *Oryzopsis asperifolia*, 1, raceme, 2, spikelet; C, *Alopecurus pratensis*, 1, spike, 2, spikelet; D, *Stipa spartea*, 1, spikelets, 2, grain; E, *Phalaris arundinacea*, 1, part of panicle, 2, spikelet; F, *Hierochloe odorata*, 1, panicle, 2, spikelet; G, *Milium effusum*, 1, part of panicle, 2, spikelet; H, *Sphenopholis obtusata*, 1, panicle, 2, spikelet; I, *Koeleria cristata*, 1, panicle, 2, spikelet; J, *Poa pratensis*, 1, part of panicle, 2, spikelet; K, *Festuca octoflora*, 1, spike, 2, spikelet; L, *Bromus*; M, *Asprella hystrix*, 1, spike, 2, spikelet.

Panicum—Panic Grass

(L. **panicum**, panic grass)

Pl. 20, fig. A : 1, 2

Annual or perennial grasses with small, 1 or 2-flowered spikelets, mostly in panicate inflorescences; flowering scales generally firm and shiny. Many species, difficult of determination.

Oryzopsis—Mountain Rice

(Gr. **oryza**, rice, **opsis**, look)

Pl. 20, fig. B : 1, 2

Leaves crowded at the base, spikelets 6-8 mm. long

O. asperifolia

Alopecurus—Foxtail Grass

Pl. 20, fig. C : 1, 2

Spikelets about 5 mm. long, in a dense spike-like panicle

A. pratensis

Stipa—Porcupine Grass

(L. **stipa**, tow)

Pl. 20, fig. D : 1, 2

Leaves convolute, long twisted awns

S. spártea

Phálaris—Reed Canary Grass, Ribbon Grass

(Gr. **phalaris**, a kind of grass)

Pl. 20, fig. E : 1, 2

1. Leaves green

P. arundinácea

2. Leaves striped with white

P. arundinácea picta

Hieróchloe—Seneca Grass

(Gr. **hieros**, sacred, **chloe**, grass)

(Savastana)

Pl. 20, fig. F : 1, 2

Aromatic grass with short leaf blades

H. odoráta

Miliun—Tall Millet Grass

(L. **miliun**, millet)

Pl. 20, fig. G : 1, 2

Spikelets in loose panicle; branches slender

M. effúsum

Sphenópholis

(Gr. **sphen**, a wedge, **pholis**, a scale)

(Eatonia)

Pl. 20, fig. H : 1, 2

Spikelets in a close panicle, second scale obtuse

S. obtusáta

Koeléria

(Named for the botanist Koeler)

Pl. 20, fig. I : 1, 2

Spikelets in a spike-like panicle

K. cristáta

Póa—Meadow Grass

(Gr. **poa**, grass)

Pl. 20, fig. J : 1, 2

1. Pedicels shorter than the spikelets

a. Flowers cobwebby at base

P. praténse

b. Flowers not cobwebby at base

P. ánnua

2. Pedicels longer than the spikelets

P. Wólfii

Festúca—Fescue Grass

(L. **festuca**, straw)

Pl. 20, fig. K : 1, 2

1. Annuals; awn about as long as scale

F. octoflóra

2. Perennials

a. Leaves rolled, scales awn-pointed

F. ovína

b. Leaves flat, scales obtuse

F. nútans

Brómus—Brome Grass

(Gr. **bromos**, oats)

Pl. 20, fig. L

Annual with numerous drooping spikelets

B. tectórum

Asprélla—Bottle-brush Grass

(L. **asper**, rough)

(Hystrix)

Pl. 20, fig. M : 1, 2

Spikelets with many long spreading awns

A. hýstrix

Iridales Iris Family

Amaryllidáceae—Amaryllis Family

* Herbaceous plants, usually with scapes or leafy stems from bulbs, corms, or rootstocks; sepals 3, petals 3, stamens 6, pistil 1, ovary 3-celled, inferior; flower syncarpous, sympetalous or rarely

apopetalous, epigynous, regular or somewhat irregular; sepals petal-like, the perianth tube often bearing a conspicuous crown within the petals.

I. Flowers with a crown-like or tubular appendage within the perianth *Narcissus*

II. Perianth unappendaged

1. Petals and sepals alike; native *Hypoxis*
2. Petals smaller than the sepals; cultivated *Galanthus*

Narcissus—Narcissus, Daffodil

(Gr. **Narkissos**, a mythological character changed into this flower)

Pl. 21, fig. A

1. Flowers solitary
 - a. Crown as long as the petals and sepals *N. pseudo-narcissus*
 - b. Crown shorter than the petals and sepals
 - (1) Flowers yellow or whitish, crown about one-half the length of the sepals and petals *N. incomparabilis*
 - (2) Petals and sepals pure white, crown short with a red or orange margin *N. poeticus*
 2. Flowers in clusters
 - a. Leaves 3-5 mm. wide; flowers bright yellow *N. jonquilla*
 - b. Leaves 10-30 mm. wide; flowers white to yellow *N. tazetta* and its hybrids
- The last named, the commonest greenhouse species, is not hardy, but some of its hybrids such as those with *N. poeticus* are hardy.

Hypoxis—Star-grass

(Gr. **hypo**, under, **xis**, sour)

Pl. 21, fig. C : 1, 2

Leaves grass-like, arising from a corm; flowers yellow *H. hirsuta*

Galanthus—Snow-drop

(Gr. **gala**, milk, **anthos**, flower)

Pl. 21, fig. B

Drooping white flowers in earliest spring, the petals small and marked with green *G. nivālis*

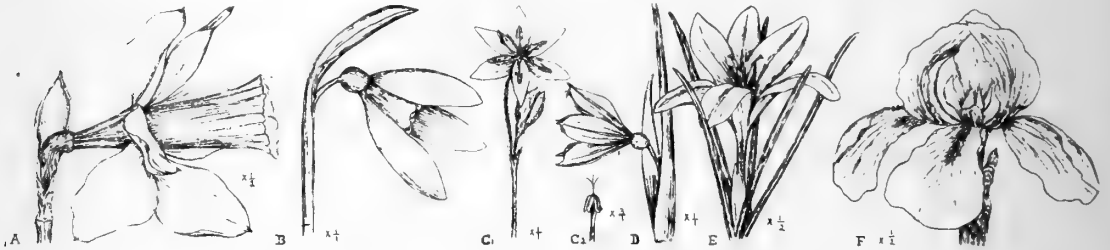


PLATE 21: A, *Narcissus pseudo-narcissus*; B, *Galanthus nivalis*; C, *Hypoxis hirsuta*; D, 1, *Sisyrinchium campestre*, 1, flower, 2, stamens and pistil; E, *Crocus vernus*; F, *Iris germanica*.

Iridaceae—Iris Family

Herbaceous plants with bulbs, corms, or rootstocks, from which come the solitary flowers, scapes, or leafy stems; sepals 3, petals 3, stamens 3, pistil 1, ovary 3-celled, inferior, style with three branches; flower syncarpous, sympetalous or apopetalous, epigynous, regular or somewhat irregular; sepals petal-like, but sometimes differing considerably from the petals.

I. Style branches petal-like, concealing the stamens, petals unlike the sepals *Iris*

II. Style branches not petal-like, stamens obvious, petals and sepals similar

1. Stemless; flowers rising directly from the corm *Crocus*
2. Flowers borne in a cluster at the summit of a scape *Sisyrinchium*

Iris—Blue Flag, Fleur-de-lis

(Gr. *iris*, rainbow)

Pl. 21, fig. F

I. Plants with rootstocks and flat straddling leaves

a. Sepals bearded

- (1) Beard of sepals forming a line along the midrib, sepals usually larger than the petals

- (a) Plants dwarf; the flowering stalks 3 dm. tall or less

- x. Plant about 1 dm. tall, nearly stemless; flowers purple, yellowish or white

I. pumila

- y. Plants 1.5-3 dm. tall; flowering stem manifest

- (x) Bracts green; flowers resembling *I. pumila*, but larger

hybrids of *I. pumila*
with *I. germanica*, etc.

- (y) Bracts papery; flowers bluish lavender, beard white

I. Cengialti

- (b) Plants more than 3 dm. tall (German iris)

- x. Flowers usually in May

- (x) Bracts green tinged with purple, flowers various shades of purple, beard yellow

I. germanica

- (y) Bracts papery, flowers nearly white with purple veins, fragrant

I. florentina (orris-root)

- y. Flowers in late May and June

Various garden hybrids chiefly of the following species:

- (t) Sepals yellow, petals pale yellow

I. flavescens

- (u) Sepals yellow, veined and shaded with brown, petals yellow

I. variegata

- (v) Sepals dull purple, beard yellow, petals dull lilac, or yellowish

I. squaleus

- (w) Sepals veined with red purple, otherwise as (v)

I. sambucina

- (x) Flowers white, edged with lavender

I. plicata

- (y) Flowers violet to nearly white

I. pallida

- (z) Flowers lilac with a white beard, stem leafless, forking low

I. aphylla

- (2) Beard not confined to the midrib of the sepals, petals larger than the sepals (Cushion iris)

- (a) Petals and sepals marked with black on a silvery white ground

I. susiana

- (b) Petals and sepals variously colored, usually marked with purple or brown on a white ground

Numerous species little cultivated; the best are hybrids of *I. Korolkowii*

b. Sepals not bearded

- (1) Dwarf and nearly stemless; flowers with a long narrow perianth tube, and crested sepals

I. cristata

- (2) Flower stems 4-10 dm. long, perianth tube short

- (a) Cultivated; leaves 5-8 mm. wide

- x. Flowers numerous, bright blue or white, bases of old leaves very fibrous

I. sibirica

- y. Flowers 2-3, pale lilac-blue, bases of old leaves not fibrous

I. missouriensis

- (b) Native; leaves 8-18 mm. wide

I. versicolor

II. Plants with bulb; leaves not straddling

a. Dwarf; stemless; flowers with a long perianth tube

- (1) Leaves flat; petals very small, spreading

I. persica

- (2) Leaves thick; petals narrow, erect, flowers purple, very fragrant

I. reticulata

b. Flowering stem 2-4 dm. long, perianth tube short, flowers of various colors

I. xiphium

Crocus—Crocus

(Gr. *krokos*, the crocus)

Pl. 21, fig. E

I. Flowers yellow

1. Anthers orange, sepals brownish on outside

C. susianus

2. Anthers pale, sepals clear yellow

C. moesiacus

II. Flowers violet to white

C. vernus

Sisyrinchium—Blue-eyed Grass

(Gr. *sisyrrinchion*, a bulbous iris)

Pl. 21, fig. D : 1, 2

1. Leaves 2-6 mm. wide; stem prominently winged; spathe and bract glabrous

S. angustifolium

2. Leaves .5-2 mm. wide; stem narrowly winged; spathe and bract scabrous or puberulent

S. campéstre

Orchidales Orchid Order

Orchidaceae—Orchid Family

Perennial herbs, with bulbs, corms or tuberous roots, leaves sheathing sometimes reduced to scales; flowers irregular, with one of the petals more or less modified into a lip-like structure, often with a spur below the lip, ovules minute and numerous; sepals 3 (or 2 by fusion), petals 3, stamens 1 or 2, ovary 1-celled; flower syncarpous, apopetalous, epigynous, irregular.

I. Lip slipper-like, stamens 2

Cypripedium

II. Lip not slipper-like, stamen 1

1. Leaves of current season absent or concealed at time of flowering

- a. Rootstock coral-like; plant entirely leafless

Corallorrhiza

- b. Plants with corms; leaves present in late summer or autumn

- (1) Flowers numerous, small; leaf appearing in autumn

Aplectrum

- (2) Flower solitary, large; leaf appearing at close of flowering season

Arethusa

2. Leaves conspicuously present at time of flowering

- a. Flowers showy, pink and white

- (1) Flower solitary; lip sack-shaped

Calypso

- (2) Flowers in a raceme, lip flat

- (a) Sepals and lateral petals spreading, the latter thread-like

Liparis

- (b) Sepals and lateral petals convergent, lanceolate

Orchis

- b. Flowers greenish, lip flat

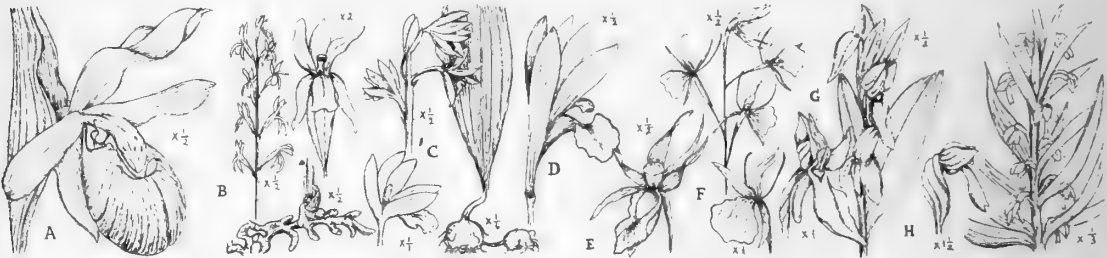
Habenaria

PLATE 22: A, *Cypripedium hirsutum*; B, *Corallorrhiza trifida*, inflorescence, flower, rootstock; C, *Aplectrum hiemale*, inflorescence, flower, plant in winter condition; D, *Arethusa bulbosa*; E, *Calypso bulbosa*; F, *Liparis liliifolia*; G, *Orchis spectabilis*; H, *Habenaria bracteata*.

Cypripedium—Ladies' Slipper, Moccasin Flower

(Gr. *Cypris*, Venus, *pedion*, slipper)

Pl. 22, fig. A

1. All three sepals separate

C. arietinum

2. Lateral sepals grown together, forming a single structure behind the lip

- a. Plant with two basal leaves; plant with one flower

C. acule

- b. Plants with stems leafy to the top

- (1) Lip pink and white, large, as long as the sepals

C. hirsutum (*C. reginae*)

- (2) Lip yellow or white, shorter than the sepals

- (a) Lip yellow

- x. Lip 1.3-3 cm. long, sepals purple-brown

C. parviflorum

- y. Lip 3-5 cm. long, sepals brownish yellow

C. parviflorum pubescens
(*C. hirsutum*)

- (b) Lip white

C. candidum

Corallorhiza—Coral-root
(Gr. **korallion**, coral, **rhiza**, root)
Pl. 22, fig. B

Lip of the flower two-lobed above the base *C. trifida*

Apléctrum—Adam-and-Eve
(Gr. **a-**, without, **plektron**, spur)
Pl. 22, fig. C

Flowers dull yellowish brown, leaf lasting through the winter, sometimes still present at flowering time *A. hiemálc*

Arethúsa—Arethusa
(Classical name of a nymph)
Pl. 22, fig. D

Plant with a solitary flower, and a single grass-like leaf which appears as the flower withers *A. bulbósa*

Calýpso—Calypso
(Gr. and L. **Calypso**, the name of a goddess)
Pl. 22, fig. E

Plant with a single basal leaf and a pink flower with a sack-like lip *C. bulbósa*

Líparis—Twayblade
(Gr. **líparos**, fat, in allusion to the smooth and greasy looking leaves)
Pl. 22, fig. F

Plant with two basal leaves and a small raceme of pink-purple flowers *L. liliifólia*

Órchis—Showy Orchid
(Gr. **orchis**, orchid)
Pl. 22, fig. G

Flowers showy, leaves 2, broad, basal *O. spectábilis*

Habenária—Rein Orchid
(L. **habena**, a rein, in allusion to the strap-like lip or spur)
(Coeloglossum)
Pl. 22, fig. H

Lip three-toothed at the tip, bracts longer than the flowers *H. bractéata*

Glossary

- Achene** A dry, one-seeded fruit
Acuminate Gradually tapering to a point
Acute Sharp-pointed
Alternate Not opposite; with a single leaf at each place of attachment
Annual Lasting only one growing season
Anther The upper part of the stamen, containing the pollen; the pollen pouch
Apetalous Without petals
Apex Tip or upper end
Apocarpous Having or consisting of separate carpels
Apopetalous Having or consisting of separate petals
Appressed Lying close to or against another organ
Aquatic Growing in the water
Ascending Growing obliquely upward
Awl-shaped Narrowed upward from the base to a slender, rigid point
Awn A slender bristle-like structure
Awn-pointed Tipped with an awn
Axil The angle between leaf and stem
Axillary Borne in the axils of leaves
Axis A term generally applied to that portion of a branch which bears the flowers or the parts of a flower
- Barbed** Having a tip like a fish-hook
Basal Arising from the base
Beak An elongated tapering structure
Beaked Bearing a beak
Bearded With hairs limited more or less to a certain area of an organ
Berry A fruit in which the seeds are imbedded in a soft or fleshy substance
Biternate Twice ternate
Blade The flat, expanded part of a leaf
Bract A leaf, usually small, standing below a flower or a flower-cluster
Bracteole A small leaf or scale on the pedicel below the flower
Bristle A stiff hair or any similar outgrowth
Bulb A short stem with fleshy scales, usually subterranean
Bulblets Small bulbs
Bulbous Like a bulb; bearing bulbs
- Capsule** A dry fruit consisting of two or more carpels
Carpel A simple pistil, or one member or division of a compound pistil
Catkin An elongated axis covered with scales all around that bear either stamens or pistils
Cell A cavity or chamber in an ovary
Ciliate Provided with marginal hairs
Claw Applied to the much narrowed lower portion of a petal
Cleft Cut about half way to the middle
Climbing Growing upon a support of some kind
Compound Composed of two or more similar parts united into one whole
Compound leaf One divided into separate leaflets
Cone An elongated axis bearing stamens or thickened scales with naked ovules; the flower and fruit of conifers
Convolute Rolled up lengthwise
Cordate Heart-shaped

- Corm** A swollen fleshy base of a stem
- Corymb** A flat-topped or convex open flower cluster
- Creeping** Growing along the ground
- Crenate** Scalloped; with rounded, shallow teeth
- Crenate-toothed** With rounded teeth
- Cyme** A flower cluster in which the terminal or middle flower blossoms first; usually somewhat flat
- Deciduous** Falling off at the close of the growing period
- Declined** Bent down
- Decurrent** Applied to leaf bases, running down the stem
- Dentate** Toothed, with outwardly projecting teeth
- Denticulate** With small teeth
- Depressed** Vertically flattened
- Dioecious** Bearing pistils and stamens on different plants
- Disk** An enlargement of the axis of a flower around the base of the pistil; the group of tubular flowers in the Asteraceae
- Dissected** Cut or divided into numerous segments
- Divided** Lobed to the base
- Entire** Without lobes, divisions, or teeth
- Epigynous** Applied to a flower with the parts upon the ovary
- Erect** Standing upright
- Exserted** Projecting beyond the surrounding parts
- Fascicle** A dense cluster
- Fascicled** Borne in dense clusters
- Fertile** Bearing seeds, or bearing pollen
- Filament** The stalk bearing the anther
- Fleshy** Soft, containing more or less sap
- Flower** An axis bearing stamens or pistils or both; generally sepals and petals are associated with these
- Fruit** A ripened ovary, sometimes that part of the axis which becomes fleshy as the seeds ripen
- Glabrous** Without hairs
- Gland** A secreting surface or structure; any small appendage or protuberance having the appearance of such an organ
- Glandular** With glands or gland-like
- Glaucous** Covered with a bluish or white, fine, mealy substance, a bloom
- Globose** Spherical or nearly so
- Glume** The small scale of the spikelets of grasses and sedges
- Hastate** Arrow-shaped but with the basal lobes diverging
- Head** A dense cluster of sessile or nearly sessile flowers on a very short axis
- Herb** A non-woody plant which dies down to the ground annually
- Herbaceous** Of the nature of herbs
- Hirsute** With somewhat coarse, stiff hairs
- Hispid** With bristly stiff hairs
- Hypogynous** Applied to a flower with the other parts below the ovary
- Included** Not projecting beyond the surrounding parts
- Indehiscent** Applied to fruits that do not open or split to let out the seeds
- Inferior** Applied to an organ situated below another one
- Inflorescence** The portion of a plant bearing the flowers; mode of arrangement of flowers
- Integument** A protecting layer or coat, as the covering of a seed
- Internode** The part of the stem between two successive nodes
- Involucre** A group of leaves or scale-like leaves borne just underneath a flower or a close cluster of flowers
- Involucral** Of an involucre
- Irregular** Applied to a flower in which the petals, or other parts, are unlike

- Keel** The two fused lower petals of the flower of the Pea Family
- Keeled** Ridged, like the keel of a boat
- Lanceolate** Shaped like a lance
- Ligule** A strap-shaped organ, as the rays in the Asteraceae
- Ligulate** In the form of a strap
- Linear** Long and narrow with sides nearly parallel
- Linear-lanceolate** Narrowly lance-shaped
- Lip** Each of the main upper and lower divisions of a zygomorphic corolla or calyx; the peculiar modified petal of an orchid flower
- Lipped** Having a lip
- Monoecious** Bearing stamens and pistils on the same plant but in different flowers
- Nerve** One of the lines or ridges running through a leaf
- Net-veined** Veins running in various directions and connecting with each other
- Netted-veined** Veins running in various directions and connecting with each other
- Nodding** Hanging on a bent pedicel
- Node** The part of the stem which normally bears a leaf
- Nut** A dry, one-seeded, indehiscent fruit with a stony shell or covering
- Nutlet** A diminutive nut
- Obcordate** Inversely heart-shaped
- Oblanceolate** Inverse of lanceolate
- Oblong** Somewhat longer than broad, with the sides nearly parallel
- Oblong-lanceolate** Broadly lance-shaped
- Obtuse** Rounded or blunt
- Opposite** Applied to organs inserted at the same level but 180 degrees apart
- Orbicular** Circular
- Ovary** The part of the pistil in which the young seeds are borne
- Ovate** Shaped like the outline of an egg
- Ovule** A young seed
- Palmate** Radiately lobed or divided
- Palmately** In a palmate manner
- Panicle** A compound flower-cluster, the lower branches longest and blossoming first
- Pappus** The bristles, hairs, awns and like structures which are borne upon the fruit in the Chicory and Aster Families
- Parasitic** Growing upon and getting its nourishment from some other plant
- Parted** Deeply cleft
- Peduncle** The stalk of a flower or of a flower-cluster
- Pedicel** The stalk of a flower in a flower-cluster
- Peltate** Shaped like a shield with a stalk attached in the middle below
- Perennial** Lasting from year to year
- Perfect** A flower having both stamens and pistils
- Perfoliate** Leaves appearing to be pierced by the stem
- Perigynium** The sack-like membrane enclosing the ovary or the achene in the genus *Carex*
- Perigynous** Applied to a flower in which the parts are united into a cup around the ovary
- Persistent** Organs that remain attached after the growing season
- Petal** One of the inner set of flower leaves, usually brightly colored, of a corolla
- Petaloid** Resembling a petal, especially as to color
- Petiole** The stalk of a leaf
- Pilose** With long soft hairs
- Pinnate** Leaves divided into leaflets or segments along a common stalk
- Pinnately** In a pinnate manner
- Pinnatifid** Pinnately cleft to the middle or beyond
- Pistil** The central or terminal organ in a flower, containing the young seeds
- Pistillate** With pistils but without stamens
- Plumose** Having fine hairs on each side like a feather

- Plumy** Feathery
- Pod** A dry fruit made up of one carpel and splitting along two sides
- Pollen** The minute grains found in the anther
- Puberulent** With very short hairs
- Pubescent** With hairs
- Raceme** A more or less elongated axis bearing flowers with about equal pedicels
- Ray** One of the marginal flowers in the Asteraceae
- Receptacle** The end of a flower stalk or axis bearing the floral organs; in the Asteraceae bearing flowers
- Recurved** Bent back
- Regular** Having the members of each part alike in size and shape
- Reniform** Kidney-shaped
- Resinous** Bearing resin
- Retrose** Turned downward or backward
- Rhombic** In outline like a rhombus; obliquely four-sided
- Rootstock** An underground stem
- Rotate** Flat and circular in outline; wheel-shaped
- Rush-like** Resembling a rush
- Salverform** Having a slender tube, abruptly expanded into a flat limb
- Samara** A winged fruit
- Scabrous** Rough
- Scale** A minute or much reduced leaf
- Scape** A leafless or nearly leafless stalk bearing a flower or a cluster of flowers and arising from the underground portion of a plant
- Scurfy** With small bran-like scales on the epidermis
- Segment** One of the parts of a leaf or similar organ that is cleft or divided
- Sepal** One of the outer set of flower leaves, usually green
- Serrate** With teeth projecting forward
- Serrulate** Finely serrate
- Sessile** Without a stalk or pedicel
- Sheath** The part of a leaf or leaf base which clasps or encloses the stem
- Sheathing** A term applied to the manner in which the base of a leaf wraps the stem
- Shrub** A woody plant; smaller than a tree
- Simple** Of one piece, not compound
- Sinuate** With strongly wavy margins
- Spadix** A fleshy axis bearing sessile flowers
- Spathe** A leaf-like structure standing below an inflorescence
- Spatulate** Spoon-shaped, shaped like a spatula
- Spike** An axis bearing sessile flowers
- Spikelet** A small few-flowered spike, the flower cluster of grasses and sedges
- Spine** A sharp, woody or rigid outgrowth from the stem
- Spiny** Provided with spines
- Spur** A hollow projection from the sepal or petal of a flower
- Stamen** The organ of a flower which bears the pollen
- Staminate** With stamens but without pistils
- Staminoids** A sterile stamen
- Standard** The large upper petal of the flower of the Pea Family
- Stigma** The top of the pistil to which pollen grains become attached
- Stipule** Outgrowths of, or appendages to, the base of a petiole
- Strap-shaped** Long and narrow in outline
- Style** The narrowed or pointed part of the pistil, bearing on its top the stigma
- Stylopodium** A disk-like expansion at the base of the style, as in the Apiaceae
- Submerged** Under water
- Subtend** To stand below on the axis
- Superior** Applied to an organ situated above another one

- Sympetalous** Having or consisting of united petals
Syncarpous Having or consisting of carpels joined together
- Teeth** The regular projections along the margin of a leaf
Tendril A slender coiling organ
Ternate Consisting of three leaflets
Terrestrial Growing on the ground
Thorn A stiff sharp-pointed outgrowth from the bark or rind
Tomentose Covered with dense, matted, wool-like hairs
Trailing Creeping along the ground
Trifoliate Having three leaflets
Truncate Terminated by a nearly straight edge or surface
Twining Winding spirally about a support
- Umbel** A flower-cluster with all the pedicels arising from the same point
Umbellate Borne in umbels
Unarmed Without spines, thorns, or prickles
- Valve** One of the portions into which some dry fruits split; a trapdoor-like opening in the pollen chambers of some anthers
Vestigial Reduced almost to disappearance
Villous With long soft hairs not matted together
- Webby** With a tuft of slender, curly hairs
Whorl A group of three or more similar organs, as leaves, radiating from the place of attachment
Whorled Borne in a whorl
Wing One of the two lateral petals of the flower of the Pea Family
Zygomorphic Applied to a flower with petals of different form

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